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2001 AWARDS

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Stronger
Sleeker*

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Tweaking XP

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AUSTRALIAN PERSONAL COMPUTER

ISSUE 276 DECEMBER 2001

ISSN - 0725-4115 Print Post Approved PP25500300559

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you may need
a bigger tree



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DESKTOPS



Dell Dimension™ desktops integrate the latest technologies to bring you a powerful stand-alone or basic network environment solution – all at budget-friendly prices. Every Dimension™ desktop is custom-built featuring Intel® Pentium® or Celeron™ processors, scalable hard drives and advanced multimedia capabilities. And, of course, all Dell Dimension™ desktops are backed by our 1-Year On-Site Service.²



DIMENSION™ 4300

Pictured with optional 19" Trinitron Monitor (add \$677).

- Intel® Pentium® 4 Processor 1.5GHz
- 128MB RDRAM
- 48X Max CD-ROM
- 16MB ATI Rage Ultra 4X AGP Graphics Card
- 20GB¹ HDD
- 15" Colour Monitor (13.8" v.i.s.)
- Microsoft® Windows® XP Home Edition
- Microsoft® Works Suite 2001 – OEM Version
- 1-Year Limited Warranty (1 Year Next Business Day On-site² Service and 1 Year Parts)

\$1,499*

\$10.15
PER WEEK

VALID TEL 7/12/01
PRICE INCLUDES GST. DELIVERY ADDITIONAL

CONSUMER LOAN
CONDITIONS APPLY

Please Quote when ordering
E-VALUE CODE B241103 - 470211



DIMENSION™ 2100

Pictured with optional 19" Trinitron Monitor (add \$847).

- Intel® Celeron™ Processor 900MHz
- 128MB PC100 shared³ SDRAM
- 20GB¹ HDD
- Intel® 3D Direct AGP Graphics
- 48X Max CD-ROM
- 15" Colour Monitor (13.8" v.i.s.)
- Microsoft® Windows® XP Home Edition
- Microsoft® Works Suite 2001 – OEM Version
- 1-Year Limited Warranty (1 Year Next Business Day On-site² Service and 1 Year Parts)

\$1,199*

\$8.15
PER WEEK

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NOTEBOOKS



Sidestep obsolescence with Dell Inspiron™ notebooks. These portables are designed for rapid integration of the latest mobile technology with plenty of options to help maximise performance and minimise costs. All Inspiron™ notebooks are powered by Intel® processors and advanced multimedia features and offer multiple display options.



INSPIRON™ 2500

- Mobile Intel® Celeron™ Processor 900MHz
- 128MB shared³ SDRAM
- 10GB¹ HDD
- Intel® Integrated 3D AGP graphics
- 14.1" XGA TFT Display (1024x768res)
- Sound Blaster compatible Audio
- 24X Max CD-ROM ■ 3.5" FDD
- Microsoft® Windows® XP Home Edition
- Microsoft® OEM Works Suite 2001
- 1-Year Limited Warranty (1 Year Next Business Day On-site² Service and 1 Year Parts)

\$2,299*

\$15.60
PER WEEK

VALID TEL 7/12/01
PRICE INCLUDES GST. DELIVERY ADDITIONAL

CONSUMER LOAN
CONDITIONS APPLY

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3D Tour Visit
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INSPIRON™ 4100

- Mobile Intel® Pentium® III Processor 1GHz-M featuring Intel® SpeedStep™ technology
- 128MB SDRAM ■ 10GB¹ HDD ■ 3.5" FDD
- 16MB ATI RAGE MOBILITY RADEON-P 4 X AGP Graphics
- 14.1" XGA TFT Display (1024x768 res)
- 3D Positional Sound with Wavetable
- 24X Max CD-ROM
- Microsoft® Windows® Millennium Edition
- FREE Microsoft® Windows® XP Home Upgrade coupon (terms apply). Call for details.
- Microsoft® OEM Works Suite 2001
- 1-Year Limited Warranty (1 Year Next Business Day On-site² Service and 1 Year Parts)

\$2,999*

\$20.35
PER WEEK

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CONDITIONS APPLY

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WORKSTATIONS



A step beyond the business desktop, Dell Precision™ Workstations are designed to deliver advanced performance. These highly scalable systems are tested, optimised and certified to run demanding workstation-class applications.



Optional 17" flat panel monitor - 1651* and optional chassis stand for \$21*

Workstation Value

PRECISION™ 340

- Intel® Pentium® 4 Processor 1.6GHz/400MHz fsb
- Intel® 850 chipset ■ 256MB PC800 ECC RDRAM
- 36GB¹ SCSI HDD (10,000rpm)
- 32MB ATI Radeon VE (Dual) DVI Graphics Card
- 17" Trinitron Flat Display Monitor (16" v.i.s.)
- Integrated 3Com 10/100 Ethernet Controller
- Integrated Dual ATA-100 EIDE Controller
- Integrated 16-Bit Sound
- 48X Max Variable EIDE CD-ROM Drive
- Microsoft® Windows 2000
- 3-Year Limited Warranty (with 3-Year Next Business Day On-site² Service)

\$3,579*

\$24.30
PER WEEK

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CONDITIONS APPLY

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Pictured with optional 17" flat panel monitor - add \$1308*

High Performance Workstation

PRECISION™ 530

- Intel® Xeon™ Processor 2GHz/400MHz fsb
- Intel® 860 chipset ■ 512MB PC800 ECC RDRAM
- 64MB Nvidia Quadro 2 Pro 4x AGP Graphics Card
- 40GB¹ Ultra ATA Hard Drive (7,200rpm)
- 17" Trinitron Flat Display Monitor (16" v.i.s.)
- Integrated 3Com 10/100Mbps 3C920 with WuOL
- Integrated Dual ATA-100 EIDE Controller
- Integrated Ultra 160/M SCSI Controller
- Integrated 16-Bit Sound
- 16x CDRW Drive
- Microsoft® Windows 2000
- 3-Year Limited Warranty (with 3-Year Next Business Day On-site² Service)

\$5,479*

\$37.15
PER WEEK

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CONDITIONS APPLY

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NEW



DIMENSION™ 2100

Pictured with optional
19" Trinitron Monitor (add \$847).

- Intel® Celeron™ Processor 900MHz ■ 20GB¹ HDD
- 128MB PC100 Shared² SDRAM ■ 56K Modem
- SoundBlaster Live! Value 576 Voice Sound Card
- PC Stereo Speakers ■ Intel® 3D Direct AGP Graphics
- 48X Max CD-ROM ■ 15" Colour Monitor (13.8" v.i.s.)
- Microsoft® Windows® XP Home Edition
- Microsoft® Works Suite 2001 – OEM Version
- 1-Year Limited Warranty (1 Year Next Business Day On-site³ Service and 1 Year Parts)
- Optional 1 Year Internet Access with OzEmail⁴ (fees apply)
- **FREE GIFT:** Your choice of one of the following: **UPGRADE TO CD-RW, UPGRADE TO Harmon Kardon 695 Speakers with Subwoofer or Lexmark Z32 Printer**

\$1,499*

\$10.20*
PER WEEK

VALID TILL 7/12/01
PRICE INCLUDES GST DELIVERY ADDITIONAL

CONSUMER LOAN
CONDITIONS APPLY

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E-VALUE CODE B211101-470211



DIMENSION™ 4300

Pictured with optional 19" (18" v.i.s.)
Trinitron Monitor - add \$677*

- Intel® Pentium® 4 Processor 1.8GHz ■ 20GB¹ HDD
- 128MB 133MHz SDRAM ■ 48X Max CD-ROM
- 17" Colour Monitor (15.9" v.i.s.)
- SoundBlaster Live! Value 576 Voice Sound Card
- Harmon Kardon Stereo Speakers ■ 56K Modem
- 32MB nVidia GeForce2 MX AGP Graphics Card
- Microsoft® Windows® XP Home Edition
- Microsoft® OEM Works Suite 2001
- 1-Year Limited Warranty (1 Year Next Business Day On-site³ Service and 1 Year Parts)
- Optional 1 Year Internet Access with OzEmail⁴ (fees apply)
- **FREE GIFT:** Your choice of one of the following: **UPGRADE TO CD-RW, UPGRADE TO Harmon Kardon 695 Speakers with Subwoofer or Lexmark Z32 Printer**

\$2,299*

\$15.60*
PER WEEK

VALID TILL 7/12/01
PRICE INCLUDES GST DELIVERY ADDITIONAL

CONSUMER LOAN
CONDITIONS APPLY

Please Quote when ordering

E-VALUE CODE B211104 - 470211



DIMENSION™ 8200

Pictured with optional
19" Trinitron Monitor (add \$677).

- Intel® Pentium® 4 Processor 1.8GHz ■ 20GB¹ HDD
- 256MB RDRAM ■ 16X Max DVD-ROM
- 32MB nVidia GeForce2 MX AGP Graphics Card
- SoundBlaster Live! Value 576 Voice Sound Card
- 56K Modem ■ PC Stereo Speakers
- 17" Colour Monitor (15.9" v.i.s.)
- Microsoft® Windows® XP Home Edition
- Microsoft® Works Suite 2001 – OEM Version
- 1-Year Limited Warranty (1 Year Next Business Day On-site³ Service and 1 Year Parts)
- Optional 1 Year Internet Access with OzEmail⁴ (fees apply)
- **FREE GIFT:** Your choice of one of the following: **UPGRADE TO CD-RW, UPGRADE TO Harmon Kardon 695 Speakers with Subwoofer or Lexmark Z32 Printer**

\$2,599*

\$17.65*
PER WEEK

VALID TILL 7/12/01
PRICE INCLUDES GST DELIVERY ADDITIONAL

CONSUMER LOAN
CONDITIONS APPLY

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INSPIRON™ 2500

- Mobile Intel® Celeron™ Processor 900MHz
- 128MB Shared² SDRAM ■ 20GB¹ HDD
- Intel® Integrated 3D AGP graphics ■ 3.5" FDD
- 14.1" XGA TFT Display (1024x768res)
- Sound Blaster compatible Audio ■ 24X Max CD-ROM
- Microsoft® Windows® XP Home Edition
- Microsoft OEM Works Suite 2001
- Internal mini PCI 56K Capable Fax Modem
- 1-Year Limited Warranty (1 Year Next Business Day On-site³ Service and 1 Year Parts)
- Optional 1 Year Internet Access with OzEmail⁴ (fees apply)
- **FREE GIFT:** Your choice of one of the following: **UPGRADE TO 8x Max DVD ROM, Lexmark Z32 Printer or Carry Case**

\$2,499*

\$16.95*
PER WEEK

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INSPIRON™ 4100

NEW

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www.dell.com.au/inspiron4100tour

- Mobile Intel® Pentium® III Processor 866MHz – M supporting Enhanced Intel® Speedstep™ technology
- 128MB PC133 SDRAM ■ 20GB¹ HDD ■ 3.5" FDD
- 16MB ATI RAGE MOBILITY Radeon-P 4 X AGP
- 14.1" XGA TFT Display (1024x768 res)
- 3D Positional Sound with Wavetable ■ 24X Max CD-ROM
- Internal mini PCI 56K capable fax modem
- Microsoft® Windows® Millennium Edition
- Microsoft® Windows® XP Home Upgrade coupon (terms apply). Call for details.
- Microsoft OEM Works Suite 2001
- 1-Year Limited Warranty (1 Year Next Business Day On-site³ Service and 1 Year Parts)
- **FREE GIFT:** Your choice of one of the following: **UPGRADE TO 8x Max DVD ROM, Lexmark Z32 Printer or Carry Case**

\$2,999*

\$20.35*
PER WEEK

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PRICE INCLUDES GST DELIVERY ADDITIONAL

CONSUMER LOAN
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Performance Notebook Package

INSPIRON™ 8100 G1000GT

- Mobile Intel® Pentium® III Processor 1GHz – M featuring Intel® Speedstep™ technology
- 512KB L2 Cache ■ 256MB SDRAM ■ 20GB¹ HDD
- 32MB DDR 4x AGP NVIDIA® GeForce2 Go
- 3D Positional Sound with Wavetable
- Harmon/Kardon® Odyssey™ 2 Speakers (Internal)
- 15" SXGA TFT Display (1400x1050 res)
- 24X Max CD-ROM ■ Microsoft® Windows® XP Home Edition
- Microsoft® Works Suite 2001 – OEM version
- Internal Mini-PCI 56K Capable Fax Modem
- 1-Year Limited Warranty (Next Business Day On-site³ Service)
- Optional 1 Year Internet Access with OzEmail⁴ (fees apply)
- **FREE GIFT:** Your choice of one of the following: **UPGRADE TO 8x Max DVD ROM, Lexmark Z32 Printer or Carry Case**

\$3,599*

\$24.40*
PER WEEK

VALID TILL 7/12/01
PRICE INCLUDES GST DELIVERY ADDITIONAL

CONSUMER LOAN
CONDITIONS APPLY

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SERVERS



The Dell PowerEdge™ family of high-performance servers offers a system for virtually every need and budget, with the built-in headroom your growing business has to have to keep pace with your ever expanding needs. Dell™ server solutions range from the entry level PowerEdge™ 500SC and the small office and workgroup class PowerEdge™ 2500SC through to the departmental PowerEdge™ 4400 and up to the enterprise PowerEdge™ 6400.



Scalable Workgroup Server

POWEREDGE™ 2500SC

- Intel® Pentium® III Processor 933MHz (Dual Processor Capable)
- 256KB Internal L2 Cache/133MHz fsb
- 18GB¹ 10K Ultra160 SCSI Hard Drive
- 128MB (2x64) SDRAM with ECC
- **FREE UPGRADE TO: 256MB SDRAM (4X64) with ECC**
- 3.5" 1.44MB Diskette Drive
- Embedded Intel® Pro 100+ NIC
- Integrated Dual Ultra3 (Ultra 160) SCSI Adaptec AIC-7899
- 24X Max EIDE CD-ROM Drive
- 3-Year Limited Warranty (With 1-Year Next Business Day On-site³ Service)

\$3,999*

\$27.10*
PER WEEK

VALID TILL 7/12/01
PRICE INCLUDES GST DELIVERY ADDITIONAL

CONSUMER LOAN
CONDITIONS APPLY

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Basic Server at Our Lowest Price

POWEREDGE™ 500SC

- Intel® Celeron™ Processor 800MHz
- **FREE UPGRADE TO: Intel® Celeron™ Processor 900MHz**
- 128KB Internal L2 Cache/100MHz fsb
- 64MB 100MHz SDRAM with ECC
- 10GB¹ IDE Hard Drive
- 3.5" 1.44MB Diskette Drive
- Embedded Intel® Pro 100+ NIC
- Integrated IDE Controller
- 48X Max EIDE CD-ROM Drive
- 3-Year Limited Warranty (With 1-Year Next Business Day On-site³ Service)

\$1,399*

\$9.50*
PER WEEK

VALID TILL 7/12/01
PRICE INCLUDES GST DELIVERY ADDITIONAL

CONSUMER LOAN
CONDITIONS APPLY

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PACKED TO THE BRIM DIMENSION™ 4300 DESKTOP

Looking for an advanced desktop at an affordable price? Look no further than the NEW Dimension™ 4300. The 4300 delivers Intel® Pentium® 4 processing power and SDRAM memory for the best combination of performance and price. From only \$1999* plus delivery, this is another great deal from the World's number #1 PC vendor*.

- Intel® Pentium® 4 Processor 1.5GHz
- 128MB 133MHz SDRAM ■ 20GB* HDD
- 16X Max DVD-ROM
- 15" Colour Monitor (13.8" v.i.s.)
- SoundBlaster Live! Value 576 Voice Sound Card
- Harmon Kardon Stereo Speakers ■ 56K Modem
- 32MB nVidia GeForce2 MX AGP Graphics Card
- Microsoft® Windows® XP Home Edition
- Microsoft® OEM Works Suite 2001
- 1-Year Limited Warranty (1 Year Next Business Day On-site* Service and 1 Year Parts)
- Optional 1 Year Internet Access with OzEmail® (fees apply)
- **FREE GIFT:** Your choice of one of the following: **UPGRADE TO CD-RW, UPGRADE TO Harmon Kardon 695 Speakers with Subwoofer or Lexmark Z32 Printer.**

\$1,999*

VALID TILL 7/12/01
PRICE INCLUDES GST. DELIVERY ADDITIONAL

\$13.55

PER WEEK
CONSUMER LOAN.
CONDITIONS APPLY.

Please Quote when ordering
E•VALUE CODE B211107 - 470211



Dell Dimension™ 4300 pictured with optional 19" (18" v.i.s.) Trinitron Monitor, add \$847*

Dimension™ FREE Bonuses

At Dell™, you get to choose how your system is put together. For any Dimension™ system featured you also get to choose a free bonus peripheral from below.

Upgrade to
16x/10x/40x CDRW



Lexmark® Z32 Printer
(available in black)

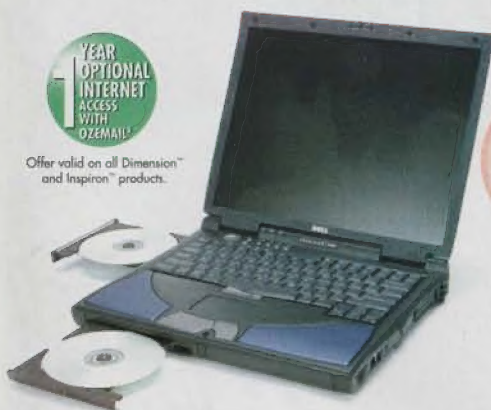


Upgrade to
Altec Lansing
ACS-695 Speakers
with Subwoofer

FREE BONUSES



Offer valid on all Dimension™ and Inspiron™ products.



Pictured with optional colour kit (add \$43*) and CDRW drive (add \$858*).
3D Tour Visit www.dell.com.au/inspiron8100tour

STUFFED FULL OF GOODIES INSPIRON™ 8100 G1200U NOTEBOOK

The NEW Inspiron™ 8100 is a first from Dell™. It looks like a notebook, but on the inside it's a whole new machine offering the NEW Mobile Intel® Pentium® III Processor 1.2GHz - M featuring Intel® Speedstep™ technology, PC133 SDRAM, and on-die 512K L2 cache to give you ultimate speed and power on the road.

- Mobile Intel® Pentium® III Processor 1.2GHz - M featuring Intel® Speedstep™ technology
- 512KB L2 Cache ■ 256MB SDRAM
- 20GB* HDD ■ 32MB DDR 4X AGP NVIDIA® GeForce2 Go™ 3D Video
- 3D Positional Sound with WaveTable
- Harmon/Kardon® Odyssey® 2 Speakers (Internal)
- 15" Super XGA+ TFT Display (1400x1050 res)
- 8X Max DVD-ROM ■ Microsoft® Windows® XP Home Edition
- Microsoft® Works Suite 2001 - OEM version
- Internal Mini-PCI 56K Capable Fax Modem
- 1-Year Limited Warranty (Next Business Day On-site* Service)
- Optional 1 Year Internet Access with OzEmail® (fees apply)
- **FREE GIFT:** Your choice of one of the following:
UPGRADE TO 8x Max DVD ROM, Lexmark Z32 Printer or Carry Case.

\$4,299*

VALID TILL 7/12/01
PRICE INCLUDES GST. DELIVERY ADDITIONAL

\$29.15

PER WEEK
CONSUMER LOAN.
CONDITIONS APPLY.

Please Quote when ordering
E•VALUE CODE B511105 - 470211

Inspiron™ FREE Bonuses

At Dell™, you get to choose how your system is put together. For any Inspiron™ system featured you also get to choose a free bonus peripheral pictured here.



Lexmark® Z32 Printer
(available in black)



Upgrade to
8x Max DVD

CARRY CASE

FREE BONUSES



DELL PCs use genuine Microsoft Windows
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www.dell.com.au

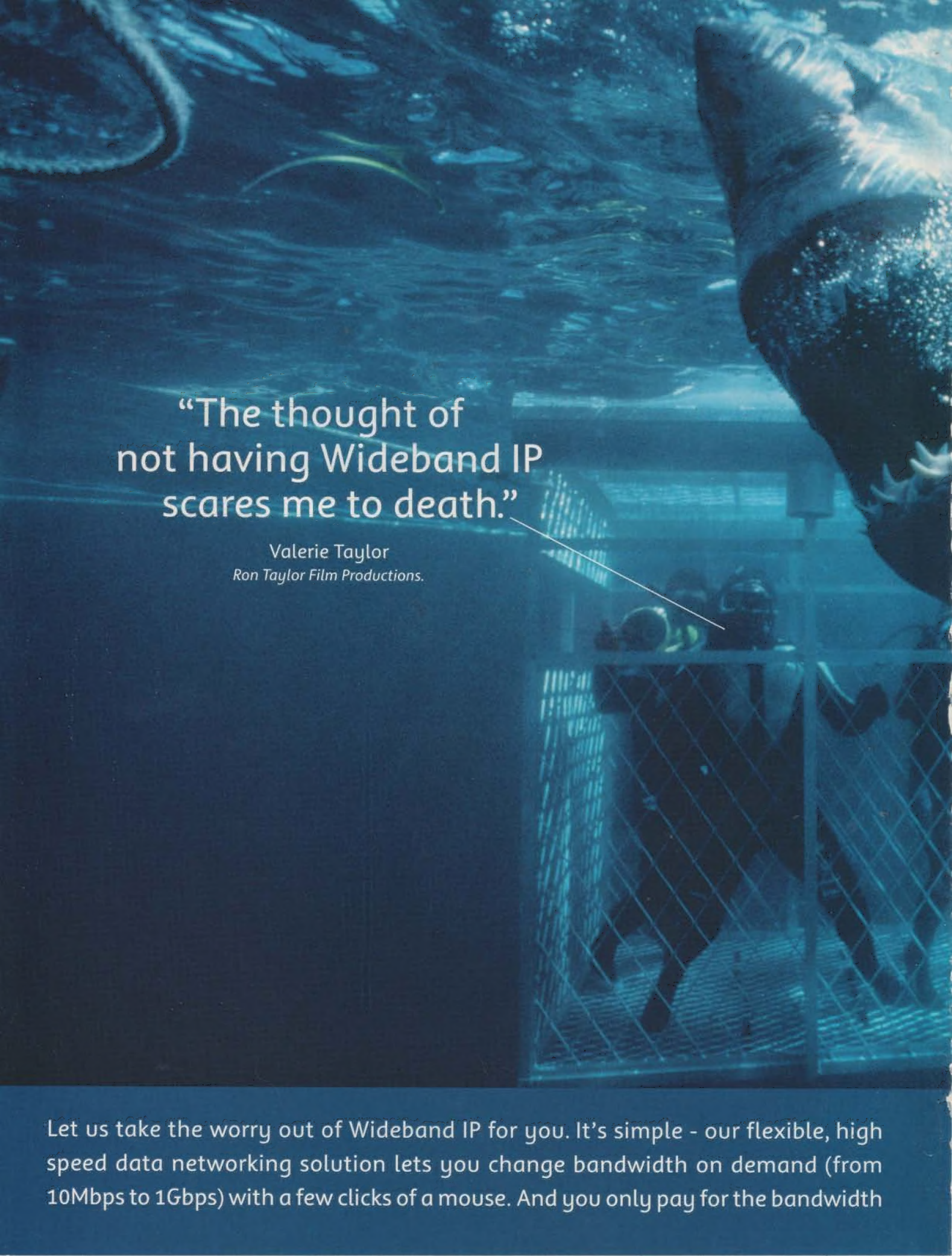
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DELD5174/APC/RH

An underwater scene with a large shark swimming towards a metal cage containing divers. The scene is dimly lit with blue tones, creating a sense of danger and suspense. The shark's head and teeth are visible on the right side of the frame, while the cage and divers are in the lower right. The text is overlaid on the left side of the image.

“The thought of
not having Wideband IP
scares me to death.”

Valerie Taylor
Ron Taylor Film Productions.

Let us take the worry out of Wideband IP for you. It's simple - our flexible, high speed data networking solution lets you change bandwidth on demand (from 10Mbps to 1Gbps) with a few clicks of a mouse. And you only pay for the bandwidth

A large shark is swimming underwater, its head and open mouth with sharp teeth visible. It is positioned near a metal cage, which is partially visible on the left side of the frame. The water is blue and turbulent with bubbles.

www.telstra.com

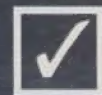
Telstra

you need when you need it. For information and to find out more about how Telstra Wideband IP can help your business, call your account representative or call us on 1800 003 006. **Technology solutions that let you do what you do best.**



Fires on all cylinders

Pistons



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OBJECTIVE: Build top-of-the-line notebooks that deliver the all-round refinement of class-leading sports cars.

METHOD: Zoom in on the user experience. Eliminate key irritations and bottlenecks. Streamline, relentlessly.

RESULT: Machines that effortlessly overtake everything else on the road.

PROOF: Weight cuts and advanced ergonomics yield unrivalled handling: increased battery life means fewer pit stops: shorter boot and resume times (provided Microsoft® Windows XP is installed*) make them quicker off the mark: optional integrated wireless communications keep users connected while they roam: rich digital-media

Toshiba PCs use genuine Microsoft® Windows®
<http://www.microsoft.com/piracy/howtotell>

Ditto ☒

Portège 4000 with Mobile Intel® Pentium® III processor featuring Intel® SpeedStep™ technology and Toshiba Tecra 9000 with Mobile Intel® Pentium® III processor-M.

systems keep the adrenaline pumping: Intel® Pentium® III processors drive blistering performance: radical styling generates powerful feelings of envy in observers.

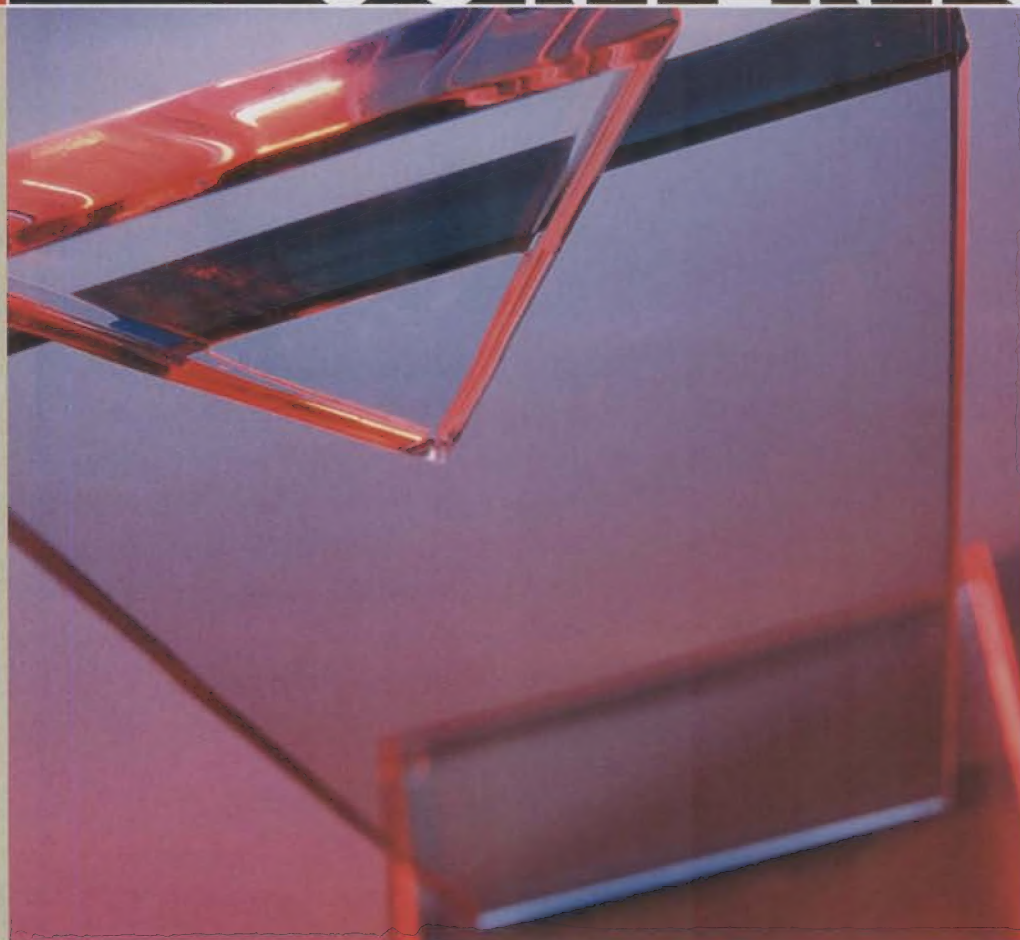
ACTION: Test drive the Portège 4000 or Tecra 9000 at your Toshiba reseller. For information call 1800 021 100 or visit www.isd.toshiba.com.au

*Microsoft® Windows XP Professional upgrades available when launched, and installed by your reseller. Preinstalled on Toshiba Tecra 9000 and Portège 4000 from Dec 2001.

TOSHIBA

It's a whole new world out there.

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APC TECHNOLOGY AWARDS 2001

80 THE APC AWARDS RECOGNISE PRODUCTS THAT STAND OUT AS THE BEST IN THEIR CLASS. ALL UP, THERE'S 12 CATEGORIES SPANNING A RANGE OF HARDWARE AND SOFTWARE FROM THE PAST 12 MONTHS. SIMPLY THE BEST OF THE BEST.

NEED TO KNOW

14 GEAR

- **Universal Translator:** You'll never again be lost for words in a foreign country.
- **Nokia 5510:** A phone that looks like a game controller. And why not.

16 TECHNICAL NOTES

- Online Christmas shopping stalled by terrorism.
- Federal elections and the Web.
- AIIA usernames and passwords exposed online. Whoops.
- Dot bomb auction gear highest selling IT equipment in Australia.

40 WATCHDOG

Estore customer service falls to pieces and company loses credit card support from Westpac.

ON TEST

REVIEWS

Latest and greatest technology releases

- **AMD Athlon XP:** This quiet achiever has the Pentium 4 in its cross hairs. We pull apart the architecture, compare it to the Intel chip line, and look at which users are best served by it.
- **Canon PowerShot G2:** Four

megapixel, 3x zoom, compact flash, and it can take a microdrive attached. The best digital camera released this year.

■ **HP PSC 750:** The hottest multifunction device for printing, scanning and copying to pass through the APC Labs in a long time. No compromises here.

■ **Hercules ProphetView 720:** This video card maker thought there was only one certain way to ensure the best screen quality: build their own monitor. A 15in flat-panel display with photo-quality colour resolution, in a lightweight, all-metal blue textured case. A great first effort.

70

LABS CHALLENGE

Soundcard soundoff: six soundcards reviewed and benchmarked using the most comprehensive sound testing equipment.

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PRET-A-PORTABLE

- 48 SLIM, SEXY, POWERFUL, PORTABLE. APC FINDS EVERYTHING YOU NEED TO STAY CONNECTED ON THE ROAD, PLUS PUTS SEVEN TOP SLIMLINE NOTEBOOKS THROUGH THE LABS.

SMART

90 BUSINESS:

Network Appliances

These all-in-one servers handle your Web, email, file, print and security needs at a fraction of the cost to do it all separately. APC looks at how two businesses are making use of these boxes, plus we review and rate four new units.

108 CAREERS:

Drown-proof your career

If you trust your employer to manage your career, you're effectively outsourcing your future. Here's how to take control of your destiny.

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SMART BOOKS:

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TECHLIFE

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A high-tech treasure hunt with handheld GPS units. The booty's not much chop, but the fun factor more than makes up for it.

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PC GAMES

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It's still WWII and you're still stuck in a Thai jungle, but with a new cast of characters, weaponry, opposition and mission objectives.

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Chopper. Features commentary by Mark Brandon Read.



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165 HANDHELDS

Want to improve the Palm's search feature, make it easier to work with Graffiti, switch back and forward quickly between programs, access a wider variety of alarm sounds, even overclock your Palm so that it runs faster? The answer is to hack your Palm! Check this out for the ultimate Palm hackers guide.

apcmag.com

This month has been another busy month on apcmag.com with some interesting behind-the-scenes work in progress. Of course there has been the usual content with special features and exclusive Web-only articles, but we've been most excited about the new features that should see apcmag.com become a more useful site.

Don't forget, if you have any thoughts, comments or suggestions with regard to the site you can email them to us at apc@apcmag.com. Enjoy!

TOOLBARS-A-GO-GO

As part of APC's commitment to give you access to the broadest range of information, we are developing an apcmag.com toolbar. The first instalment was released this month on apcmag.com in the form of a Jobnet search toolbar. This means you can now visit your favourite Web site and search the Jobnet database at the same time. There is also an Advanced search toolbox featured on the Smart Careers section of apcmag.com. Simply log on to apcmag.com and click on the Smart Careers link.

TALKING POINT

The apcmag.com article discussion forums are filling up nicely with loads of relevant and useful posts from readers. Rest assured that all these posts are read by the staff at APC and are followed up if any action is required. APC staffers are also on the look-out for particularly interesting posts to be included in the APC magazine, so log on to apcmag.com and have your 15 minutes of fame.

DID YOU KNOW?

- That you can now sign in to your Hotmail Web mail account directly from apcmag.com? You'll find the login box at the right-hand side of any apcmag.com Web page.
- Microsoft .NET sign in has just been released and coincides with ninemsn's new customisation utility. To try out the new feature, head to ninemsn.com.au with your .NET passport and click on the customise link at the top of the site. If you don't yet have a .NET passport, don't worry — you can sign up for one during the registration process.

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XP SPEED TWEAKS

There's no need to settle for the Windows XP you've been given. Time to tweak!

INTAVA GRAVITY

Make specialised versions of your Web sites for the mobile market.

VIRTUAL NETWORK COMPUTING

Have complete use of and control over a remote desktop. This software is crossplatform too.

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CD2 HIGHLIGHTS

GAME ON

CD 2 has a massive 250Mb of games demos including Throne of Darkness, a medieval Japan-themed game based on the Diablo engine.

DEVELOPERS CORNER

DELPHI The latest version of Delphi has hit the streets and you can freely develop non-commercial software with this Personal version.

KYLIX At last, a Delphi-compatible Linux development language and environment — and its compiler produces actual machine code.

MICROSOFT .NET The .NET Framework Software Development Kit (SDK) includes everything developers need to write, build, test and deploy .NET Framework applications.

CD3 HIGHLIGHTS

GAME ONLY ZONE

Bursting with bandwidth suckers, CD 3 is the gamer's wet dream. It's full to saturation point with playable demos of the hottest titles this season.

CD 3 INDEX

PC GAMES SPECIAL

Frank Herbert's Dune, Kohan: Immortal Sovereigns, Max Payne, Red Faction, Return to Castle Wolfenstein, Sheep, Dog 'n' Wolf, Stronghold, The Mystery of the Druids

NEED HELP?

> While we've taken all care in selecting the software and testing the CD, APC cannot accept responsibility or liability.

> APC does not provide support for programs included on the CD.

> For technical problems with the CD itself:

Email cd@apcmag.com **Web** www.apcmag.com/cd **Phone** (02) 9288 9123



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ISSUE 276 DECEMBER 2001



Choosing 'the best' of *anything* is never easy. Choosing some dozen of the best products from a field as crowded as computers and technology, in a year that's seen so many great releases, can be a very tough call indeed. This year's APC Technology Awards were no exception.

The winners are not without some controversy, which in itself reflects how much has changed in the past 12 months. Turn to page 80 and you'll see for yourself.

This year we've also made a number of significant changes to the awards. For starters, we've overhauled the categories so that they're broader in scope as well as being more numerous. There's also a clearer hierarchy, a pyramid that steps from a core set of categories to Best Hardware and Best Software, culminating in the overall honour of being named Best Product of the Year.

The result not only makes for a great read, it's a ready-made Christmas shopping list. Just circle the gear you want (I suggest using a thick red pen) then leave this copy sitting in a conspicuous location opened to the relevant page.

These annual awards signifies the end of the calendar year for APC, and it's been a good year for us. We celebrated 21 years as Australia's number one technology magazine, and we totally upgraded the magazine to help set our course for the next 21. And we're still making changes to ensure we're the best magazine in our class.

We're already "Reviews Central" when it comes to the latest hardware, software, add-ons and accessories, applying as our first and ever-underlying principle the notion that the gear has got to do something for you. It's about more than the feeds and speeds. Next year we'll take that extra step beyond reviews and show you how to make the technology work for you.

As both a magazine and a Web site, APC is firmly committed to remaining your essential companion to computers and technology.

David Flynn

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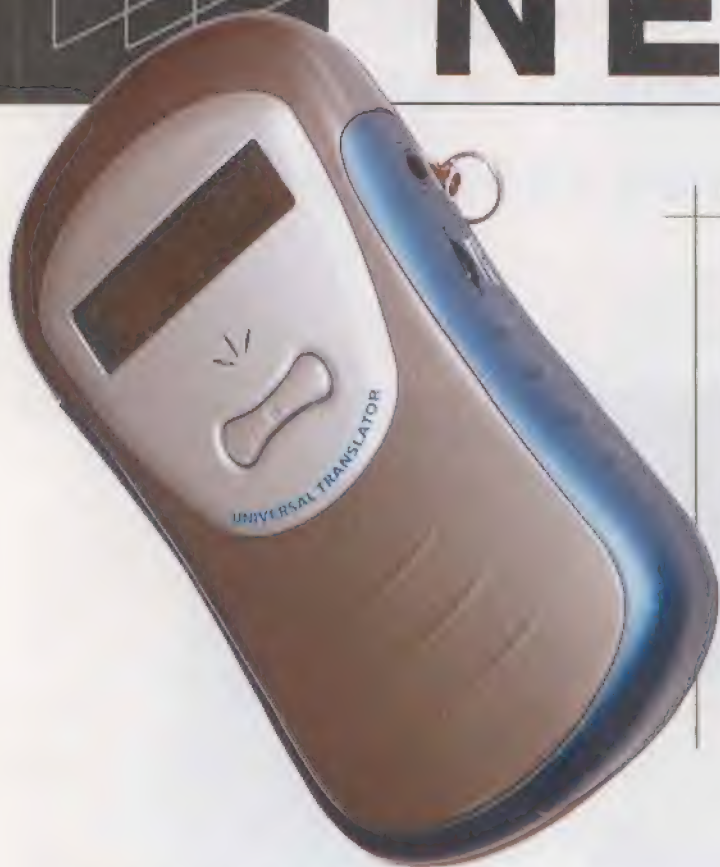
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The UT-103 mostly supports European languages, but there are other translators available for Asian languages. Unfortunately, there's no American-to-English model.

Contact Ectaco **Online** www.ectaco.com

Price US\$250 (\$485)

MUSIC TO GO

Music CDs? Bah! Get yourself Apple's new iPod, which stores tunes on a handy built-in 5G hard drive. There's enough room here for roughly 1,000 MP3s, or you can even use it to carry your homework or a business report. The iPod's big advantage over most other MP3 players is the Firewire port, which means you can transfer an entire CD in less than 10 seconds. Battery

life has also improved — this time you get about 10 hours playing time. Interestingly, the only copy protection the iPod offers is a sticker on the box that says: "Don't steal music". Of course, you'll need a Mac; maybe this could be the excuse you've been waiting for?

Contact Apple **Phone** 133 622

Online www.apple.com.au **Price** \$895



PHONE AND GAMES

No, it's not the GameBoy Advance 2, or a new controller for the PlayStation 2 — it's the new Nokia 5510 mobile phone. The keyboard wings are designed for use with both hands, game controller style, but this keyboard's not just for typing in phone numbers or SMSing.

The 5510 combines phone, MP3, FM radio and WAP capabilities, and just in case you thought the gamepad design was lacking, there are five games built into the unit, with further entertainment available for download.

Contact Nokia **Phone** 1300 366 733

Online www.nokia.com.au **Price** TBA

KNOW

HIGH RESOLUTION

So the Sony Handycam doesn't suit your style? If you're after something more professional, take a look at Canon's XL1S digital video camera. This camera is bristling with features, including all sorts of exposure controls for shooting in the most difficult conditions. Three CCD image sensors achieve highly accurate colour reproduction and detail, and superior low light performance means that low budget horror flick you always wanted to make is within your grasp. There's also an interchangeable lens mount, so if you get really dedicated (and have lots of money), you can splash out on another lens. The camera has that "pro" look, with a magnesium alloy chassis and carry handle. Now, where's that wish list I had for Santa?

Contact Canon Australia

Online www.canon.com.au

Phone (02) 9805 2000

Price \$8,999



GRAB BAG

Once upon a time, a laptop bag meant a satchel with a bit of extra padding. No style, no extras, no nothin'. Not any more. Enter LowePro's Linx range of "Urban Hip" bags for digital cameras, notebooks and MP3 players. This model comes with three movable dividers to organise your gear, and seven pockets, including ones for memory and batteries, and extra side pockets. There's even a space for your phone and keys, so now you don't have to go scrounging amongst the rubbish on the bottom for all those little things. Best of all, you can slide the bag around when it's on your back and access your gear through a special zip on the side. There's also a comfy "DryFlo" mesh-lined strap — we're not sure what it means, but it sounds exciting . . .

Contact Maxwell Optical Industries **Phone** (02) 9390 0200

Online www.maxwell.com.au **Price** \$119



SMALL AND LIGHT

You want the smallest, lightest digital video handycam in the world? Then you want the Sony DCRIP7, a nifty little camera that weighs in just a tad over 300g. Don't be deceived by its looks — this baby is packing some serious features, including Memory Stick slot, USB port, the new MICROMV recording format, iLink port, and even Moviestaker editing software. It's also got wireless Bluetooth capabilities, which means you can surf the Internet or send emails using the camera. Handy for sending pictures and small video grabs, although we're not sure why else you'd try and get online with a camera.

Contact Sony Australia **Phone** 1300 137 669

Online www.sony.com.au **Price** \$4,499



► Santa plans for virtual deliveries, but shoppers still likely to go to stores for Christmas buying

Ho Ho No?

JINGLE BELLS, JINGLE BELLS —
ARE WEB RETAILERS GOING TO
MAKE A BUCK THIS CHRISTMAS?

Christmas shopping is upon us. You know the drill — make your list, grab your credit card(s), pick a shopping centre, and psych yourself up for the crowds and the queues.

Only this year it's a little different. The lead-up to the silly season has been filled with doom and gloom, especially since September's terrorist attacks. Anthrax scares, refugee crises, war; it's no wonder retailers are being cautious about Christmas sales this year.

In America, if you believe the reports, more people have been closeting themselves at home since September 11. The Consumer Electronics Association surveyed 1,000 homes that use the Net, of which 44% said they have watched more TV since the attacks. Overall, people were 12% more likely to use telephones and 9% more likely to surf the Net than before.

Is this an over-exaggeration? Retail revenues in Australia "took a big hit", said Australian Retailers Association chief Phil Naylor. David Jones media spokesperson Jill Campbell agrees: "It wasn't just us; it was restaurants, cinemas, anywhere there are large crowds."

Still, it's hard to see shoppers flocking to do their Christmas shopping on the Web. "It might get a bit of a boost, but I don't think it

will mean online shopping booms while offline [revenue] falls off a cliff," said Charles Britton of the Australian Consumer's Association.

What about a prediction? "We are one of the few really well known, highly regarded sites around. There's not many of them now," Campbell said. Still, most of the business

online is still going overseas. A survey by Hitwise of visitors to "department store" sites for the week ending October 20, found nearly 50% of traffic was to US site Amazon.com. In second place was the David Jones site, with 6.58% of traffic.

William Maher

STRANGE BEDFELLOWS

A week is a long time in politics, but four years is an eternity on the Web. This year, the spin doctors finally made the Web an important part of their campaigns. Here's a wrap-up of the role the Web played in this year's federal election:

- Labor put the Net on the agenda early on during a stoush on October 9 with talkback radio host Alan Jones. Jones accused Labor of deleting policies from the ALP Web site. Beazley pointed out the policies were there, "just one click away".
- The Web came up again during the infamous Howard versus Beazley "worm" television debate. In the ongoing argument over border protection and refugees, Beazley challenged Howard to publish the first version of the bill, Beazley's comments and the final version of the bill side by side for public viewing. The Liberal party took up the challenge and published the documents on their Web site a few days later.
- The Web even became a story in its own right, when the chief executive of the Internet Industry Association, Peter Coroneos, told BRW magazine that 5.1 million of the 12.5 million registered voters



have regular access to the Internet. "There is now a critical mass of voters on the Internet, which is a very low cost campaigning medium compared with television, radio and print," Coroneos said in the article.

- By mid-campaign, the minor parties were in full swing on the Web. Web addresses were attached to newsletters, updates, press releases and policy statements from One Nation to the Greens. But while Bob Brown and Natasha Stott Despoja were claiming youth support, it was the ALP who hijacked pop culture with their site, politicalbigbrother.com. With a theme based on the TV show, visitors were invited to vote members of the Liberal cabinet out of "the house".
- The Australian Electoral Commission also provided exhaustive electoral information on candidates, margins, history and real time coverage of the vote counts. In another four years, perhaps they'll be offering online voting?

Alex Cramb

THE AIIA HAS NO CLOTHES

WITH NEW FEDERAL PRIVACY LEGISLATION COMING IN AT THE END OF THE YEAR, YOU WOULD HOPE THAT THE COUNTRY'S PEAK INDUSTRY BODY FOR IT WOULD BE LEADING THE CHARGE TO COMPLY. WE'RE NOT SURE.

The Australian Information Industry Association (AIIA) accidentally left a database of 3,523 of its members on its Web site for the entire world to view. This database had such helpful details as usernames, job titles, company names, email addresses and passwords to the AIIA's Web site.

Finding the passwords was as easy as doing a quick Web search. We typed in the name of an AIIA member and BAM! — up came the details, along with a long list of names and passwords.

We contacted a member (who wishes to remain anonymous) in the list to see if the data was accurate. His reaction was: "Yep that's my username and password alright." We directed him to the link. "Oh dear — it's . . . just sitting there!"

Not only are these lists prized by spammers, but the passwords also provided access to exclusive member-only areas of the AIIA Web site. Here members can take part in discussions and, recently, even nominate members for the AIIA's board of directors. It turned out the passwords had been sitting online for close to two months. Richard



► 'So anyone can find a username and password on unprotected web servers? Sheesh, who'da thunk.'

Lindsay, the government Relations Manager, explained that new passwords were generated when the AIIA's new site went online in August, but the files were inadvertently left on the Web server.

We also asked what security testing had been done on the site. "We're checking that as well," said Lindsay. The AIIA suspended all passwords for the site, and later sent out new passwords.

The incident is particularly embarrassing for the AIIA, which boasts in its Information Handling Policy that it sets an "important example" when it comes to privacy.

The AIIA also sells a "privacy tool kit" to help businesses comply with new rules for protecting sensitive data. The kit has a minimum price of \$2,000, but this latest news may make some buyers rethink the purchase.

Jim Stewart

INTEL DROPS TOYS

WHEN TIMES ARE TOUGH, IT'S TIME TO DITCH THE FUNKY DIGITAL MICROSCOPES.

Yes, Intel is dropping its "Connected Products Division", the fancy name for its consumer toys like MP3 players, game controllers and digital cameras. Most of the stock should last through Christmas, but sometime after that the toys will more than likely become collector's items.

While by no means struggling, Intel has been hit like many others by slow PC sales in 2001. Net earnings for the third quarter were US\$106 million, a 96% drop from the same period in 2000.

For anyone wanting a souvenir of the "old days", when even processor companies could dabble in



► Intel's Craig Barrett (second from right) ponders that microscope.

toys, this could be it. Imagine the bewildered look on the face of an IT analyst in 10 years' time when you unveil an original Intel QX3 Plus Computer Microscope, with magnifying lens for viewing insects and hair samples. Or the Intel computer Sound Morpher, for animating sounds in "wild and wacky ways".

William Maher

GET HAMMERED

Finally, more details about AMD's super-chip for powerful workstations and servers: the Hammer. Although it won't be seen till some time later this year, we know it's going to be fast.

Instead of connecting chips via slow data buses, Hammer chips will use Hypertransport technology to transfer data. AMD has also dealt with another bottleneck by strapping the memory controller on to the processor. For non-techies, all this should mean one thing -- speed, speed, speed. The only question remaining is how well the Hammer will stand up to Intel's 64-bit powerhouse, the Itanium.

THINGS TO COME?

Good old IBM. The company warns that technology is developing so fast that one day there won't be enough people to keep it all running. The solution? Let computers take care of themselves. For example, it might be possible to design a network that can heal itself, just like the human body. Computers could also identify potential problems early and fight them off. Don't IBM researchers watch B-grade blockbusters like Terminator 2? Sounds like a recipe for disaster to us.

SHIPPIN' THEM IN

So Australia's economic focus is shifting from the farm to technology? That may be, but it's not helping our trade balance. A report in *The Australian* newspaper shows we spend more on computer equipment imports than we do on food, clothing, civil aircraft and textiles combined. From 2000 to 2001, computer products took up 16% of our merchandise imports and we now have a \$15 billion trade deficit in technology equipment. The Australian Computer Society says that we have no choice about importing hardware, but we can do better with exports of software and services.



SNAP HAPPY

Japan is setting new benchmarks in the quest for recyclable products. The latest idea is the recyclable digital photo camera: you pay a fee, pick up a specially designed Pentax digital camera, take your photos and return the camera to the store to view the shots and choose your prints. The cameras are then repackaged and go back on the shelf. We presume that if you keep the camera there's no way of getting your prints; otherwise, many of the cameras might never be seen again.

PIRACY BATTLE

Ding! The next round is underway in the fight between music pirates and copyright owners. Anti-piracy teams now have a new tactic up their sleeves: annoying the hell out of downloaders. For example, special software could search Gnutella and other file-trading communities for illegally copied songs, then clog the data lines by sending lots of requests for that song. Not only that, reports say the software deliberately downloads songs very, very slowly. The only problem will be keeping up with the pirates — millions of songs are traded on the Net every month.

BEALE SCREAMER?

Microsoft has landed in hot water with its own anti-piracy technology, which prevents digital audio in the Microsoft format being copied to friends and shared on the Net. The problem is that someone calling himself Beale Screamer has found a way around the protection. The workaround doesn't let you download and play protected songs, but it does allow someone who has paid for Microsoft-protected audio to strip the protection and share the songs online. Microsoft says the problem can be solved . . . until next time, that is.

HAPPY BIRTHDAY Y2K

END OF WORLD PREPARATION GUIDE

DISCOUNTED AFTER EXPIRY DATE

"Sale! Up to 90% off" declares a sign in the Co-op Bookshop near the University of Sydney. In the bargain bin sit Digital Armageddon 2000 and The year 2000 problem solver: A five step disaster prevention plan.

If you're reading this, then you probably survived the end of the world. This Christmas though, you can celebrate the first anniversary of the biggest no-show of the century with some Y2K memorabilia. Y2K books like the brick-sized Y2K Bible: Procrastinator's Edition are still good sellers,



► 'Sure, our millennium mayhem shelter looks silly now. But who knew?'

according to the sales rep at Angus & Robertson.

"They do still sell," he said. Souvenirs maybe.

At \$20 (down from \$80), it seems the first false prophets of the new millennium can still make a fast buck, even after the death of their god.

Fiona Angus

REDUCE, REUSE, RECYCLE?

IMAGINE REPLACING YOUR PRINTER

EVERY TIME IT GETS A PAPER JAM.

John Walker's Hewlett-Packard OfficeJet developed an annoying paper jam, so he thought he'd just take it back to the David Jones store in Canberra where he bought it and get it repaired.

"I didn't know then the incredible service policy of HP," he said when they wouldn't fix it. "They don't repair these units in Australia. If anything goes wrong, no matter how minor, they exchange it for a new one." That's what the "repairer" told him when he rang up after waiting three weeks.

So what happens to all those near-new printers? HP product manager Peter Leihn says it isn't always "economic" to repair every InkJet and OfficeJet, so returned models are shipped overseas to the factory where they were made for recycling. Those with minor faults are patched up at a local centre and sold secondhand, while others are just repaired.

If your Canon printer breaks under warranty, you could also walk away with a brand new model — especially if it's one of the ultra-cheap inkjets. According to Canon product manager Glenn Stubbs, it all depends on whether it's cheaper for Canon to replace the printer or fix the particular fault. Discards end up at Canon's national warehouse in Sydney.



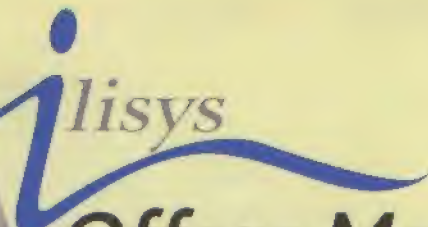
► This novelty keyboard was once a printer. Recycling rules.

"It's pulled apart for spare parts and anything that's salvageable," he said. The rest is thrown out.

Epson owners are more likely to have their printers repaired than replaced under warranty, said Epson communications manager Nancy Small. "We recover parts that aren't faulty and use them for spares," she said. Some faulty components are also repaired and re-used.

Does a new-for-old printer sound like a good deal? John Walker asked HP what would have happened if he hadn't taken out an extended warranty and needed to get his particular model fixed. "They said they charge \$385 for an exchange unit, no matter how minor the repair."

Fiona Angus



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Lite \$120/yr	5 MB			S		L												500 MB
Basic \$199/yr	20 MB	1	U		L	NT												1 GB
Plus \$275/yr	20 MB	15	U		L	NT												1 GB
SoHo \$399/yr	50 MB	30	U		L	NT												1 GB
Standard \$489/yr	100 MB	50	U		L	NT												2 GB
Heart \$599/yr	200 MB	75	U		L	NT												2 GB
Enterprise \$799/yr	500 MB	100	U		L	NT												3 GB



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(.com .net .org)

UK domains (.co.uk, .org.uk) \$20
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UK & Australian domain fees cover registration for 2 years

Comparison with other web hosters as taken from their websites on 24 September 2001

Domain name costs are for 2 years and include GST-

Company	ilisys	Telstra	Web Central	Commander	NetRegistry
.com .net .org	\$40	\$165	\$66	\$66	\$110
.com.au	\$110	\$165	\$135	\$135	\$140

Entry-level domain hosting packages

Specifications vary from package to package

Company	ilisys	Telstra	Web Central	Commander	Net Registry
Hosting package	basic	-	Economy	Brocade	The Promoter
Server space	20 MB	-	20 MB	20 MB	35 MB
Monthly transfers	1 GB	-	500 MB	500 MB	1 GB
Domain name .com	\$40	-	\$66	\$66	\$110
	for 1 year		for 2 years	for 2 years	for 2 years
Set up fee	0	-	\$64	\$59	\$108.90
Cost of basic package	\$199	-	\$420	\$370	\$382.80
Total including GST.	\$239	-	\$550	\$495	\$601.70

Business Packages

Specifications vary from package to package

Company	ilisys	Telstra	Web Central	Commander	Net Registry
Hosting package	Standard	Business	Business	Platinum	The Business
Server space	100MB	100MB	70MB	1 GB	50MB
Monthly transfers	2 GB	1 GB	750 MB	2GB	1.5 GB
Domain name .com	FREE	\$165	\$66	\$66	\$110
	for 1 year	for 2 years	for 2 years	for 2 years	for 2 years
Set up fee	0	\$110	\$97	\$99	\$108.90
Cost of basic package	\$489	\$1320	\$665	\$2990	\$778.80
Total including GST.	\$489	\$1,595	\$828	\$3,155	\$997.70

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Major computer crash.
Glare at your computer.
Kick your computer.
Yell at your computer.
Hit 'restart'.

Viruses. Every
month, 300
new arrivals.
How many are
you ready for?

Missing files.
Where did that
tax return
disappear to?

There are
one million
things to worry about.



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THE GREAT ISP SQUEEZE

DINGOBLUE HAS SLASHED BANDWIDTH CAPACITY, BLOCKING SUBSCRIBERS FROM ACCESSING THEIR ACCOUNTS.

In early October, Gary Shoell from Elizabeth Downs in South Australia was suddenly blocked from logging on at night. "The tech support guy said they were experiencing problems because of the school holidays," Gary said. "They said everything is full and to keep trying."

It was the same story in Gippsland, Victoria, where Maggie Ryan could only study for her Monash distance degree early in the morning and after 9.30pm. Even then, she was sometimes bumped off after 15 minutes. At first she thought it was the typical school holiday excuse; "I've been with them for over a year now and not even in the Christmas holidays was it like this. The person I spoke to said it was a management decision to lower the modem/user ration," she said.

Dingo spokesperson Geoff Donohue said both were correct. "There was a decision to reallocate capacity across the network," he said. "It was exacerbated by the school holidays." He said Dingo reduced the amount of bandwidth it buys from the Optus network after an internal review of the port capacity determined that there was "an overcapacity".

"It was to bring into equilibrium the demand and supply and obviously we didn't get that equilibrium right. It was very unfortunate and it was never our intention to reduce the level of service.



▶ Band-aids for bandwidth

"The capacity reallocation is about positioning Dingo to meet certain business hurdles, he said, but added that the ISP wasn't facing an "ultimatum".

Bandwidth isn't the only thing Dingo has slashed lately — 17 full-time jobs have also been axed and 11 contract positions not renewed.

Donohue said the positions were duplicated in Dingo's parent company, Australian Gas Light (AGL). AGL bought Dingo from Optus for \$21 million in December last year with an eye to offering telecommunications services to its two million energy customers. Since then, Dingo has racked up loans of \$34.2 million for working capital and everyday operations. For the twelve months ended 30 June, AGL wrote off \$20 million of its \$55 million investment in Dingo.

"Every one of AGL's business units has hurdles rates," he said. "The art of being successful in business is to utilise assets properly."

At Gary Shoell's end of the network, that wasn't happening. "If I'm paying for a service I want to be able to use it. So I took my business elsewhere."

Fiona Angus

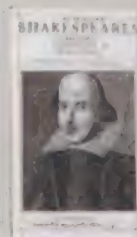
AMAZONIAN ACCOMPLISHMENT

Amazon.com is on track for its first profit ever. No, really. In the last quarter, the granddaddy of Web retail managed a net loss of US\$170 million. It didn't crack it this time, but its executives reckon it's tantalisingly close to being in the black. It should reach that goal this holiday season, although it'll only be a pro forma operating profit (which ignores certain costs and losses). The company certainly gets full marks for trying — since beginning with books, Amazon's range has extended to include kitchen supplies, power tools, barbecues and birdbaths.

I MADE IT MYSELF

Computer gamers are a dedicated bunch. After waiting since 1988 for a sequel to their favourite game, Bard's Tale, a group of fans finally decided they'd had enough — they'd make it themselves. The group of programmers and artists have teamed up with other fans around the world to work on a sequel, not just for Bard's Tale, but also for the Ultima series. The most recent publisher of both games, Electronic Arts, isn't too

impressed by the news, despite the fact both games will probably be free.



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*Savings based on maximum trade-in value for the LaserJet 4100 series under this promotion. Trade-in values vary based on printer model and whether it is an HP or non-HP printer. Trade-in must be a fully functioning laser printer, offer valid until 21 December 2001, with new printers received by that date. Terms and Conditions apply visit hp.com.au. © 2001 Hewlett-Packard Company. All rights reserved.

Notes to Consolidated Financial Statements
(in thousands except share and per share data)

NOTE 1: SIGNIFICANT ACCOUNTING POLICIES

Operations founded in 1995, we are a provider of graphic design and imaging software for Web 2.0. We offer a market-leading suite of software products, type fonts, and content for creating websites, e-business, and information types; licensing technology to software manufacturers and service providers; and offer integrated software solutions to businesses of all sizes. We distribute our products through a network of distributors and channels, value-added resellers, systems integrators, and original equipment manufacturer (OEM) partners. We also end users through Mixus, our own Web 2.0. We have operations in North America, Europe, East, and Africa.

Fiscal Year 2008

My daughter is studying graphic design. Can she take a crack at this?

disclosure of contingent liabilities, at the date of the financial statements, and reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimated.

Amend.

Cash Equivalents and Short-term Investments

Cash equivalents consist of instruments with maturities of three months or less at the time of purchase. We classify all our cash equivalents and short-term investments, and certain restricted funds and noncurrent investments in equity securities, free of trading restrictions, or to become free of trading restrictions within one year, as "available-for-sale." We carry these investments at fair value, based on quoted market prices, and unrealized gains and

in accumulated other comprehensive income, which is reflected as a separate component of stockholders' equity. We report transaction gains or losses, which are not material, in results of operations.

Property and Equipment

We record property and equipment at cost, less accumulated depreciation and amortization. Depreciation is calculated using the straight-line method over the estimated useful life of the asset. Leasehold improvements are amortized over the shorter of the lease term or the estimated useful life of the asset.

Other Assets

Purchased technology, goodwill, and other intangible assets are stated at cost, less accumulated amortization. We recognize amortization using the straight-line method over the estimated useful lives of the respective assets, generally three to seven years. Capitalized computer software development costs, which begin upon the establishment of technical feasibility, which is generally achieved upon the completion of a working prototype that has no critical bugs and is ready for release. To date, we have not recognized any impairment losses on our intangible assets.

Everyone, sign off on this proof by 5pm.

Love the typeface

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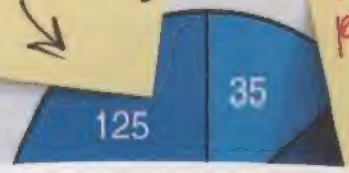
Why don't these numbers add up to 100?

Who writes this stuff anyways?

I LIKE BLUE.

HOW ABOUT WHITE

Use "solution" It sounds more professional



Nitpick all you want, digitally.



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HEAR NO EVIL, SEE NO EVIL

Telstra, Optus and Vodafone will phase out handset subsidies for mobile contracts in the new year. That means no more \$0 mobile deals. If you've been upgrading your mobile with each new plan, the move to shorter contracts with no handset will force you to rethink how long you want your mobile to last.

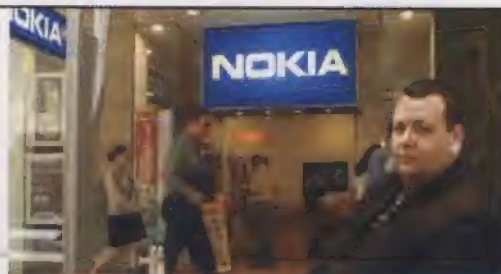
That's what Clarissa Mancuso of Sydney is asking after the LCD screen on her Nokia 8210 started to fade and die after just six months. Nokia is by far the most popular handset maker, but she isn't the only Nokia user with a fading screen.

"We are aware that some screens have a fade issue," said Nokia corporate communications manager Antony Wilson. "And there have been a small amount replaced under warranty." He declined to say how many 8210s have been returned, only that the problem is "not widespread".

Clarissa had her screen re-clipped for a small fee rather than have it repaired under her 12 month warranty (and go two weeks without a mobile). But eight months later, the fading started again. "I didn't know if it was on or not," she said. "It is totally stuffed." She's still paying off her 8210 contract.

Exasperated 8210 owners have posted requests in mobile forums in an effort to get their phones working again. On the [alt.cellular.nokia](#) and [aus.comms.mobile](#) newsgroups, users exchange tips on how to fix the problem in the 8210, as well as other Nokia models. Clarissa's old 5110 also had a fading screen. Ryan Shaw of Sydney suffered the same problem with his 3310 and had it repaired under warranty. "It made me not want to use it," he said.

It's a familiar tale to Matthew McDonald, editor of



► It's "natural" for some Nokia phones to fail because they sell so many, says Nokia

mobile forum MobileWorld.org. "Basically the Nokia LCD is not attached well enough to the printed circuit board," he said. He's seen the problem in Nokia's phones since the 5110 was released.

Wilson insists there's no manufacturing fault in the 8210. He claims it's "natural" that some are returned simply because Nokia sell so many. "Nokia products are reliable to buy," he said. As far as he is aware, the manufacturing process is the same for 8210s on sale now as for models needing repair.

So, how long is a Nokia phone likely to survive? "That's a difficult question. It really depends on how it's treated. Nokia will guarantee it for 12 months," Wilson said. If treated reasonably, he insists a Nokia will last through a 24-month contract. "If customers are having problems with their Nokia 8210 they can take it to any Nokia authorised service centre or Nokia care centre, even if their warranty has finished," he said. "Each phone is dealt with on a case-by-case basis. This doesn't necessarily mean that the repairs will be done without cost."

With the death of the handset-contract, choosing a mobile that will last how long you want it to last is a sticky issue. It goes to the heart of what you want from the latest technology — features, quality or price. Product cycles are driven by extra features, but also to benefit the company's bottom line. There are good and bad points to this but it's not driven completely in consumers interests.

Fiona Angus

WINDOW OF OPPORTUNITY

Want to install Microsoft software but don't want to buy Windows? Meet Lindows — a special version of Linux designed to run Windows programs. Still in the design stage, Lindows has special features to help install Windows programs more easily and display fonts better. There has been similar efforts before, but none have had great appeal. A preview edition of Lindows is available online, and version 1.0 is expected some time early next year.

GEEK GAMES

Has Linux, the operating software favoured by geeks around the world, finally found mainstream acceptance? News comes from Japan that Sony is releasing a kit that allows the PlayStation 2 to run Linux. The exact contents of the kit aren't clear, but it is thought to include Linux software, a hard disk unit, a keyboard, mouse and VGA adaptor for connecting the PS2 to a computer monitor. To show what might be possible, Sony has demonstrated a PS2 which runs MP3

software, a word processors and a spreadsheet. Sony says there will be "worldwide sales", but we're waiting for confirmation on an Australian version.



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A SLICE OF THE DOT COM BOMB

FULL CIRCLE

It appears that Harvey Norman will not be selling IBM PCs in the foreseeable future. The decision comes after IBM decided it would try selling PCs directly to customers in Australia as well as through retail outlets. Harvey Norman will still sell some IBM stock and will continue to service IBM machines, but the retailer said it is "winding down" sales of IBM stock. It's not the first time Harvey Norman has taken umbrage at such a decision. Two years ago, it booted Compaq out of its stores after the PC seller launched its Compaq Connect chain of retail stores. Since then, the stores have closed down and Compaq PCs are back on Harvey Norman shelves.

COMPLAIN, COMPLAIN

Australians lodged 72,264 complaints with the Telecommunications Industry Ombudsman about telephone and Internet services last financial year — a 32.8% increase on the previous year. An increased proportion of Internet users complained about Internet access problems, including problems with speed, drop-outs and outages.

Access complaints accounted for 32% of all Internet-related complaints in 2000/01, compared to 26.3% the year before. The report noted customers are expecting more from Internet services, especially high-speed Net connections. Also, there is still widespread misunderstanding about how ISPs calculate Internet time and download volumes.



► The TIO's new complaints investigation squad.

THE REMAINS OF FAILED TECHNOLOGY COMPANIES ARE FINDING THEIR WAY INTO AUSTRALIAN HOMES.

Who sells the most PC gear in Australia? IBM? Dell? HP? Auction house Hymans are a small Australian company with around 100 staff, but they flog more IT gear than anyone else.

And lately, people who shop with Hymans have walked away with some amazing bargains, courtesy of the dot com collapse. As administrators move in to dismantle failed technology ventures, consumers have the chance to get the latest and greatest technology at jaw-dropping prices.

Hymans has auctioned off the assets of about 40 collapsed dot coms since the April 2000 tech wreck, according to chief executive officer Ian Hyman. Illustrious names like LibertyOne, ASP Limited, BottleShop.com, the Satellite group (Australia's own "Gay online") and GST Pay have all graced their catalogues. "Every week there is another one," said Hyman. "In the last four months, we've sold \$35 to \$40 million just from on-site auctions."

From dealers to small businesses to people who just want a cool PC, they come in search of a bargain. "Mum and dad" buyers browse the lots clutching Harvey Norman catalogues, carefully comparing specs and prices. Hyman says they can expect to cut an average 30% to 40% off retail.

That's what 200-odd bargain hunters got when Hyman's auctioned the assets of speech recognition software developer Sayso in October. Sayso had just refitted its North Sydney office when a major investor backed out of a \$14 million funding deal, sending the company into voluntary administration.

The trendy new leather chairs and coffee table set were the first to go, followed by the grand reception counter: "It would cost you \$4,000," auctioneer Neil Schiller commented before it went to the highest bidder for just \$350. The receptionist's 433MHz Dell Dimension — with 64Mb of RAM, a 6Gb hard drive and a 19in monitor — went for \$450.

In the empty boardroom, a trophy was the only thing left on the huge custom-designed boardroom table. The remains of the once-thriving business lay scattered in what auctioneer Neil Schiller described as a "bomb site". A crowd of about 200 sifted



► Hyman's kungfuey auctioneer Neil Schiller.

through leftover personal possessions, half-finished work, staff phone lists and two-dozen bottles of beer. The rubbish bins went for \$5.

"I had no idea this was happening, I just saw the sign on the door yesterday," said nearby office worker Tonia Hogan, who had never attended an auction before. She was eyeing the PCs on offer, and had carefully set herself a price cap to compensate for not having a warranty or detailed knowledge of the machines. "If I can halve the cost, that's fine."

Around 20 of Sayso's former 70 staff watched as Schiller walked slowly but efficiently through the jumble over the next six hours, ticking off each item as it was sold. As unsecured creditors, the proceeds of the auction will go towards their unpaid entitlements. Former IT manager Scott Bragg was owed \$10,000 (not including his redundancy payout) and described the wasted office refit as "excessive".

"It's sad to see it all go, but I'm hoping to get something". He ended up splurging \$2,000 and walked away with a server rack for \$200 (worth \$4,000), a Celeron 466Mhz for \$150 and a 17in Samsung monitor for \$150. He wanted to buy his own workstation "but I thought I'd quit while I was ahead". He's still looking for another job since he turned up to work one morning and was told he no longer had a job. "I'm really pleased with the prices I got, but it means there's less money for entitlements," he said. "Getting the rack so cheaply does lessen the pain."

A handful of remaining staff were still frantically downloading company information from servers, even as interested buyers eyed it off (the PABX system was in hot demand). Schiller said the gear was likely to end up in Hymans auction rooms, which are regularly restocked for its weekly IT auction from collapsed companies and ex-corporate and government gear. These auctions raise around half a million dollars a week and are held in Melbourne, Brisbane and Canberra.

Fiona Angus and William Maher

DOT COM BOOTY

You could be forgiven for thinking the dot com crowd live by the mantra: "Live fast, die young and leave an expensive pile of computer equipment." So who's selling what, and for how much?

ONE.TEL

Telephone and Internet company

Booty: 3,500 lots, including 500 to 700 flat screen computer monitors; more than 10 plasma 42-inch monitors (worth up to \$10,000 each); PCs and notebooks; refrigerators and microwave ovens; a vintage motorcycle (sold for \$8,000); fish tanks, surfboards and a deep sea diver's suit; a church pew and brass Chinese ornamental dragons.

Who was there: 5,000 people browsed the grand ballroom of Sydney's Westin hotel over two days.

Total sales: More than \$2 million.

Memorable moments: According to Tony Crawford, partner with Ferrier Hodgson and an administrator for One.Tel, a lot of One.Tel's cool gear was only leased, so it was creditors who lost out to the tune of \$75 million. "One.Tel owned very little," he said. "Most of the stuff was leased."

GLOBALFREEWAY

Free Internet access provider

Booty: An array of networking and server equipment including three Compaq Proliant servers, hard drive racks, backup units and modems; PCs and notebooks; laser printers; a PABX telephone system; a black granite boardroom table (sold for \$600); 12 boardroom grey leather chairs (sold for \$110 each) and some limited edition prints.

Who was there: Roughly 100 people arrived for a slice of the treasure.

Total sales: Unknown

Memorable moments: The reporter who noticed an old receipt for \$7 million from a supplier lying on a desk.



► One smiling businessman forked out \$1,750 for this life-size cut-out of One.Tel's cartoon mascot, the "dude". It's cardboard, sir.

RUSHTV AND SCAPE.COM

Web "portals" for the young and hip

Booty: More than 1,500 sparkling new items for sale, including a mammoth supply of more than 90 computers; green, red and yellow office chairs; purple office desks; crate-loads of video tapes (Austin Powers, Savage Garden, The Naked Chef, The Hurricane); a Chubb alarm system; four Hewlett-Packard LaserJet printers; five Sony digital video cameras with wide angle lenses, light kits, digital monitoring headphones and hand mikes; 15 black buffalo leather visitor armchairs and a red sofa bed; 11 mobile phones and some beanbags.

Who was there: About 300 mums, dads and business people.

Total sales: "Pretty insignificant" compared to the level of debt, says Damian from Dominion Auctioneers.

Memorable moments: Among the truckloads of items for sale — two church pews.

LIBERTYONE

Diversified Internet company and Australia's first dot com

Booty: 1,000 lots of stylish office fixtures, furniture and whitegoods; scanners; new and old PCs; Apple Macintosh computers; hubs, routers and servers.

Who was there: "Hundreds of people turned up, it was wall to wall," said Ian Hyman, chief executive officer of auction house Hymans.

Total sales: Around \$1 million.

Memorable moments: "It struck us that there was a lack of control over assets, no one kept a list. Huge amounts of equipment was missing — staff had just kept it!"

KGRIND

Portal site for the cable Internet crowd

Booty: About 400 items: Pentium III PCs; Sony MiniDisc recorders; digital video camera; vinyl records, turntables and CDs; Pioneer professional DJ mixer; professional Yamaha mixing console; Internet video camera; and AGFA scanners.

Who was there: Between 80 to 100 people.

Total sales: No official estimate, but reports say a KGrind auction raised \$107,000.

Memorable moments: Bargain hunters were happy, but many KGrind staff were still owed around \$10,000 in salary, holiday pay and superannuation.

ALLMYBILLS.COM

Online bills payment

Booty: About 700 items, including four Pentium III computers; a Compaq Pentium 733MHz file server with three 9Gb hard drives and 500Mb RAM; two Dell Latitude Pentium II notebooks; and 3Com "Super Stacker" networking equipment.

Who was there: About 450 registered bidders.

Total sales: Unknown

Memorable moments: In all the excitement, Pentium III computers actually fetched more than their retail value.



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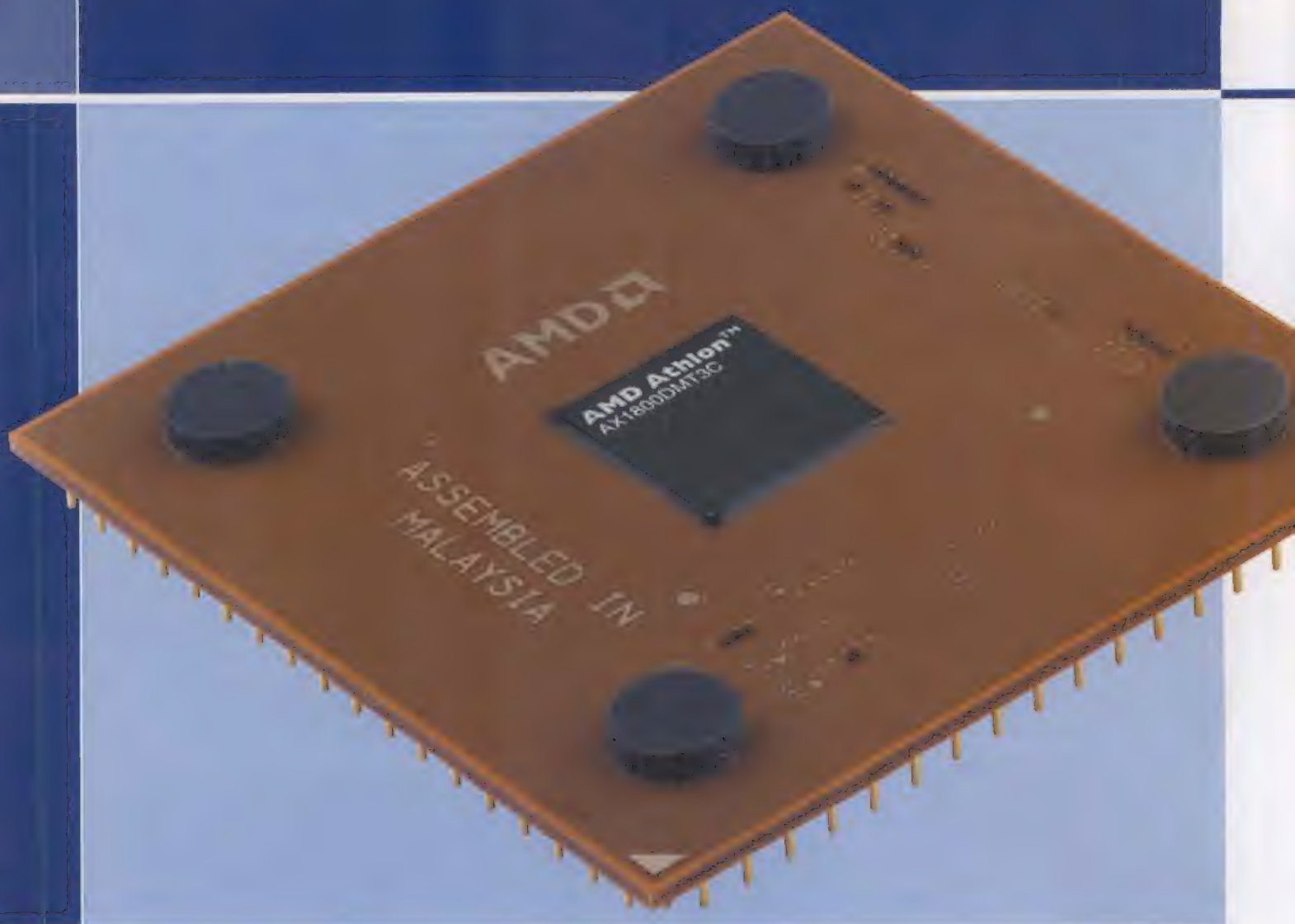


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BRONZED BEAUTIES

DESPITE VIRTUALLY OWNING THE ENTHUSIAST MARKET, AMD HAS FOUND IT DIFFICULT TO PENETRATE INTO MAINSTREAM CORPORATE AND CONSUMER

TERRITORY, WHERE THE BULK OF COMPUTERS ARE

SOLD. INTEL STILL DOMINATES THIS AREA, SO

WHAT'S AN UNDERDOG TO DO? KEEP RELEASING

THE SAME RELIABLE PRODUCTS, BUT ADD A SMOKE-

AND-MIRRORS SHOW! WELCOME TO THE ATHLON XP.

By Darren Ellis and Daniel Gardiner

Launched mere weeks before Microsoft's latest OS, the new AMD processors have only "coincidentally" ended up with the XP moniker. The XP in Athlon XP stands for the "extreme performance" that you can expect to garner from the processor coupled with Windows XP — not the "eXPerience" you'll have while you're using it, as in the Microsoft products. From a marketing standpoint, it's a good coincidence.

Along with the XP tag comes a completely new way of naming its chips. These new Athlon XP (AXP) processors come in four flavours: 1500+, 1600+, 1700+ and 1800+. You'd be forgiven for thinking that

AMD Athlon XP

an 1800+ Athlon XP ran at 1.8GHz, but you'd be mistaken. The hows and whys of AMD's new naming convention are explained in greater detail in "What's in a name?"

(page 28), but it suffices

to say that the chips, in order, have actual clock speeds of 1.33, 1.4, 1.47 and 1.53GHz. Buyer beware.

As confusing and potentially detrimental to AMD's sales strategy as this labelling may be, there's one thing that must be kept in mind at all times: these new processors are a step forward from their predecessors, instead of the step backwards and sideways that Intel took with the Pentium 4. And when APC previously compared the AMD Athlon 1.4GHz with the newer releases on P4s, the Athlon always rated favourably, even though the P4s were gradually pulling away in clock speed.

NEW KIDS

The XP processors do not differ greatly from the previous Athlons, the greatest changes being in the clock speed and core design. The 1.4GHz Athlon and earlier incarnations were based on the Thunderbird chip; the Athlon XPs are based on a new Palomino chip design. Both are manufactured using the 0.18-micron fabrication process (Intel has started producing mobile chips under the 0.13-micron process), but a change to these smaller transistors is expected in the first half of 2002.

The Palomino design is not new — it was used in the Athlon MP (a multiprocessor chip) launched earlier in 2001, and in AMD's range of mobile Athlon processors, but has been tweaked for the XP range.

The new chips have marked advantages over the Thunderbird core Athlon: they consume about 20% less power and therefore run at a lower temperature; they have 3DNow Professional instructions — 52 more than 3DNow, including support for Intel's SSE instruction set; they sport a thermal diode to monitor the core's temperature; and they have new QuantiSpeed architecture. This last addition allows the 1.4GHz AXP 1600+ to outperform the 1.4GHz Athlon Thunderbird by up to 6% in some benchmarks (see page 30) — so what is it exactly?

The four parts of the new architecture are: a fully pipelined core, a new floating point unit (FPU), hardware data pre-fetch, and exclusive and speculative translation look-aside buffers (TLBs). The AXP pipelines tread water between the 20 stages of the Pentium 4 and the 11 stages of the Athlon Thunderbird. A longer pipeline can process fewer tasks per clock cycle, but allows for the clock speed to be cranked up, whereas a shorter pipeline means more tasks can be performed per cycle, but the clock speed drops. This is also at the crux of the new naming convention.

AMD Athlon XP

Online www.amd.com.sg/au

Verdict **■■■■**

▲ A new type of instruction set, the new AMD



The hardware data pre-fetch is an interesting device that is also present in the Pentium 4. It looks ahead intuitively, and preloads any data that it thinks the CPU might need into the L1 cache, which speeds processing. The TLBs perform a similar task, but are more concerned with critical data and instructions, which prevents the processor from stalling or pausing when instructions or data are requested. The FPU is nothing new, but has been added to the QuantiSpeed lineup mainly because it is worth mentioning the Athlon's superior floating point abilities.

WHO IS IT FOR?

Ignoring clock speeds and the intricacies of the QuantiSpeed architecture, the AXP chips have some other excellent features. First is a Socket A processor, which is backwards compatible with most motherboards. It may require a BIOS update to run properly, and it's always prudent to check with your motherboard manufacturer before buying a chip. Next are a 266MHz FSB, full support for DDR-DRAM, and a 384KB cache which is split into 128KB of L1 cache (64KB instructions, 64KB data), and 256KB of L2 cache.

The final quality that makes the AXP a compelling purchase is the price. As we went to press, the Australian prices for single AXP chips were fluctuating from around \$330 for the 1500+ up to \$630 for the 1800+. This means an Athlon XP 1800+ — which outperforms a 2GHz Pentium 4 — costs less than half the Intel's price. That's a huge saving.

WHAT'S IN A NAME?

Competition is tough in the processor market, especially when your opponent seems to have a clear advantage in speed. With its new naming convention, AMD is attempting to bridge the perceptual gap between the Athlon and the Pentium 4.

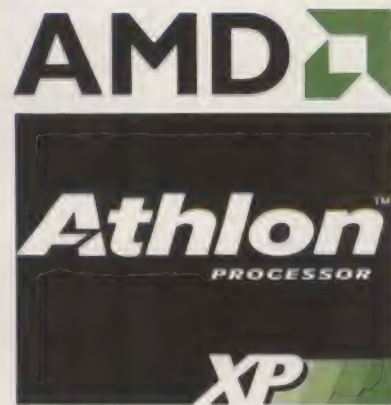
AMD's most significant obstacle in cracking the consumer market has previously been recognition. But now that Intel is clearly winning in the MHz race (if not the actual performance side), breaking into the consumer market has become even tougher.

AMD has been harping on about divergent technologies — quite accurately pointing out that clock speeds and MHz are no longer good tokens of actual performance. Most enthusiasts know that a 1.4GHz Athlon Thunderbird can match a 1.8GHz P4 in most benchmarks. Most consumers, however, do not. AMD's approach so far has been to grin and bear it. But the market downturn, shrinking profits across the industry, and a drop in support from major PC manufacturers (AMD-equipped systems have quietly slipped off more than one company's price list) has forced it to approach the problem from a different angle. Industry-wide belt-tightening could threaten to push it off the map altogether. This is what the new model numbers — and unspecified clock speeds — are all about.

The divergence of the Pentium 4 and the Athlon XP from previous architectures is where the comparison problem arises. From the 286 onwards, megahertz has been a fairly accurate way of gauging performance. The amount of work performed per clock cycle had remained fairly static up to the Pentium III and Athlon, so it was largely the increase in the clock speeds that made a chip better. Now the work-per-clock-cycle dynamic has shifted. The Pentium 4 does less work per cycle, but has a much higher clock speed, whereas the AXP does more work per cycle, but has a lower clock speed.

On a work-per-cycle plus clock speed basis, the Athlon XP comes out on top, so no surprises for guessing that AMD is turning its focus that way, or that Intel will happily keep pointing out its larger and larger clock speeds.

At its launch, the AXP came in four configurations: the 1500+, 1600+, 1700+ and 1800+. These are clocked at 1.33, 1.4, 1.47 and 1.53GHz respectively. At a retail level however, these chips will only be identified by model, not megahertz. Moreover, AMD has strictly curtailed motherboard



manufacturers, so that only model numbers are displayed inside the BIOS and on the initial boot screen. It's taking the new naming scheme very seriously.

AMD insists these new identifiers represent relative performance increases when comparing different AXP CPUs. But they also tread an uneasy ground between Pentium 4 MHz ratings and those of Thunderbird Athlons.

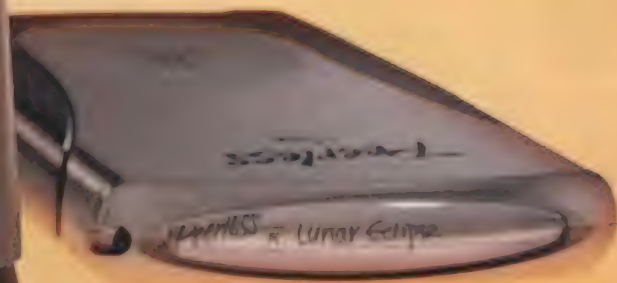
There's no doubt AMD is attempting to reap a greater portion of the consumer market, and its naming convention is, in this sense, somewhat misleading. How many computer salesmen are going to bother explaining the intricacies of how a P4 1.8GHz is different to an AXP 1800+? Most consumers are still under the impression that bigger numbers always mean better performance.

So how much will this affect the enthusiast community? Not much, actually. All the dedicated online shops we visited identified the CPU by both model number and MHz. Common system checking applications such as SISoftware's Sandra also allow you to find out exactly what frequency a CPU is running at.

So the net result of the new names? They may help sell more Athlons at a consumer level. They're cheaper to produce, and still slightly cheaper to buy compared to equivalent Pentium 4s. But AMD is still going to have to fight the battle on a lot more fronts — specifically targeting brand name recognition — if it plans to be anything more than an annoyance to Intel.

AMD STATS

	Pentium 4 2GHz	Athlon XP 1800+	Athlon XP 1700+	Athlon XP 1600+	Athlon XP 1500+	Athlon Thunderbird 1.4GHz
SYSmark2001 (Patch 3)	189	179	171	169	163	161
Winstone 2001 (1.0.2)	52.8	58.1	56.8	55.4	53.9	54.9
WinBench 99 (2.0) Business Disk WinMark	11500	9000	9000	8990	8840	8740
WinBench 99 (2.0) Business Graphics WinMark	577	869	841	814	782	770
3DMark2001	6998	7084	6919	6830	6747	6688



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THUNDERBIRDS ARE ... GONE

The best way to test a new CPU architecture is to compare it with its peers. This is what initially got the P4 into so much strife — it was hardly a leap forward compared with its predecessors. So how does the Athlon XP compare to the Athlon Thunderbird (TB)?

Before we got carried away with testing the new processors against Intel's behemoth, we wanted to compare the AXP against its Thunderbird equivalent. Benchmarking the 1.4GHz TB against the equally clocked AXP 1600+ tells an interesting story. Its graphical processing is a significant step up — nearly 6% better across the board. Its 3D wireframe processing also seems superior (6%), although we discovered this margin drops significantly (to under 1%) as the 3D models become more complex and detailed.

However, it was also interesting to note that the lower clock speed AXP 1500+ (1.33GHz) also outperforms the Thunderbird in most of the benchmarks. This speaks volumes about the superiority of the Palomino core.

BATTLE OF THE TITANS

So does the 1800+ trounce the competition? Yes and no. We tested both an AXP 1800+ and a P4 2GHz with the same hardware, save for motherboard and RAM, and turned up some interesting results.

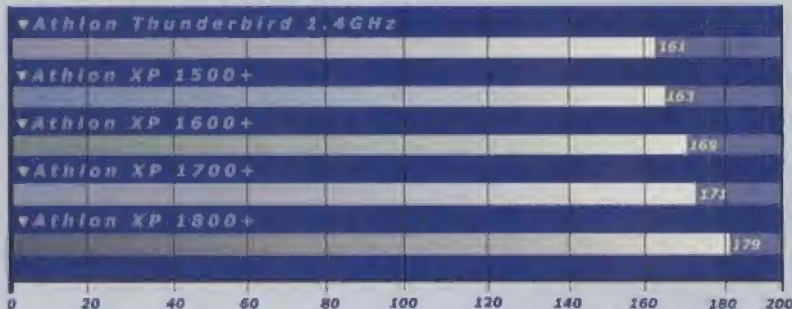
First, it's impossible to pick a winner in the applications benchmarks. The P4 continues to dominate in the multimedia creation department, despite the AXP's added support for SSE. In more traditional office applications, the AXP gains the edge.

Gamers will see little difference between the two CPUs, as the 3DMark2001 scores demonstrate. In high-resolution gaming the difference was usually 2% at most.

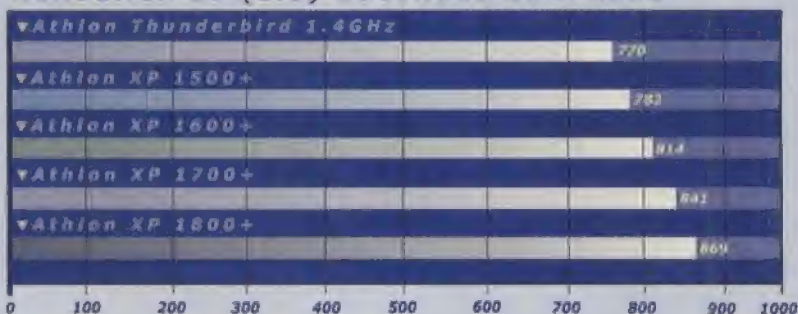
The most noticeable edge the 2GHz has is business disk access. The RDRAM in our P4 test system had almost twice the bandwidth of the DDR in our Athlon. This, combined with the 2GHz CPU, results in much faster disk access — but only for small tasks.

Still, with an average retail price of \$1,350 for the 2GHz, compared to \$600 for an 1800+, we know where we'd spend our hard-earned cash.

SYSMARK 2001 (PATCH 3)

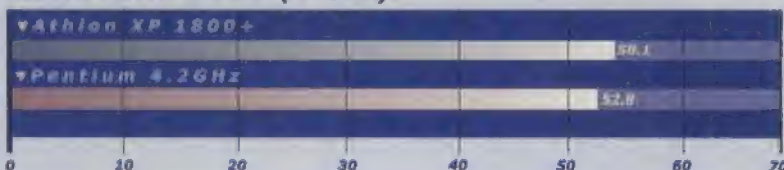


WINBENCH 99 (2.0) BUSINESS GRAPHICS

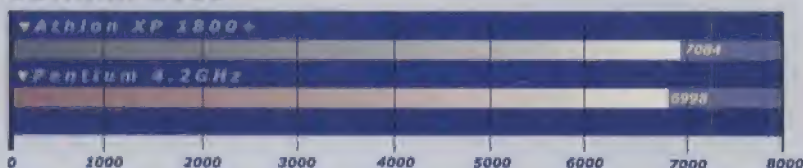


But how do the AXPs stack up? AMD claims that there is between a 3% to 5% increase as you step from one AXP to the next, which is roughly equal to the percentile increase of the clock speed itself. The benchmarks speak for themselves — there was an even progression as clock speeds scaled up.

WINSTONE 2001 (1.0.2)



3DMARK 2001



WINBENCH 99 (2.0) BUSINESS DISK WINMARK



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Make a mark

It's the PC-free approach to roadside digital photo printing. The Canon CP-10 digital printer is a half-kilo box that creates credit card-sized prints and stickers.

Hook it up to the Canon Powershot A10 and control printing (with a resolution of 300 by 300dpi) from the camera's screen. Alone it costs \$599, but this cute accessory comes with the A10 (normally \$799) for \$1,279.



Pint-size performer

Acer's Smart Camera Rave is the size of a credit card and just 18mm thick, yet this sparkly white digital camera lets you take roving still shots and digital video from your PC, and it only costs \$249. The inbuilt 8Mb flash memory holds 95 to 128 low-res 640 by 480 pixel images. Position simple shots with the tiny viewfinder and control panel or perch it on your PC with the cute clamp to download and manage images, or turn it into a handy Webcam.



PIXEL PACKING MAMA

The PowerShot G2 utilises a four megapixel CCD and a 3x zoom lens to provide outstanding images with either full auto or manual control. A 32Mb CompactFlash card is included, which gives it more storage than most of its competitors, and the ability to accept high capacity IBM Microdrives (340Mb or 1Gb) is a big plus.

Twelve shooting modes (Aperture Priority, Shutter Priority, and so on), three Autofocus modes and a fast lens (equivalent to 34-102mm f2-f2.5) remove any excuse for not taking sharp, well exposed images.

The 1.8in LCD screen provides a sharp, clear image and rotates to provide the perfect viewing angle, although an optical viewfinder is available if needed. Four resolution settings include three JPEG compression levels and the Canon RAW file format. If you want the highest quality image, be aware that the RAW format does consume a lot of space, allowing for around 10 shots on a

Canon PowerShot G2



32Mb disc as opposed to approximately 30 images when using the best JPEG setting.

A useful movie mode captures Web quality movies at 15 frames per second at up to two minutes in high resolution, or around eight minutes in low-resolution mode.

Denis Gallagher

Contact Canon Australia

Phone 1800 816 001

Online www.canon.com.au

Price \$1,999

Rating ■■■■■

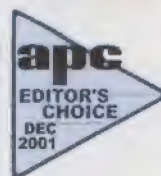
HP PSC 750

TRIPLE TREAT

The PSC 750 quickly became one of our favourite pieces of office equipment not long after it was removed from its packaging.

It prints, it scans, it copies (hence the acronym that makes up its model name) — what more could you ask for? It also performs all three of its talents astonishingly well, considering that multifunction devices generally are a compromise at best.

Even though it wasn't specifically designed for the purpose, we tested the PSC 750 as a shared device in a workgroup environment in the office. It handled itself admirably well and drivers are automatically installed on client machines directly from the host machine. Installation is made even easier by the fact that it interfaces via USB. Annoyingly, though, as is customary with all printer manufacturers except for Lexmark, no interface cables were supplied — USB or



otherwise. Printing resolution is rated at 2,400 x 1,200 dpi and employs HP's PhotoRet3 technology. The optical scanning resolution of 600 x 1,200 sounds less

impressive, but is more than adequate for most office tasks. In addition, the PSC 750 ships with integrated OCR software, which allows a quick and easy method of transferring text from a printed page into an editable format on the PC. Highly recommended for the home or small office.

Simon Tsang

Contact: Hewlett-Packard

Phone: 13 29 47

Online: www.hp.com.au

Price: \$799

Rating: ■■■■■



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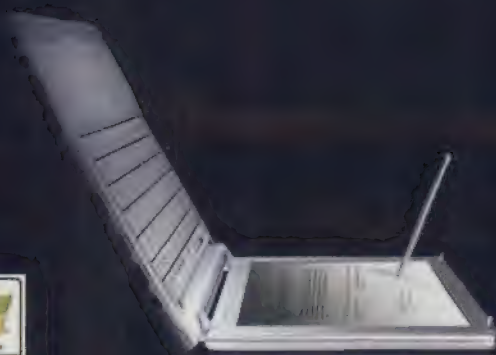


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www.lifebook.com.au Call: 1800 288 283

To the cheers of techies everywhere, Norton's industry standard for cloning hard drives has been updated to include XP support. While the interface is still decidedly "no frills", it's packed with all the extras you'll need for cloning drives. Priced at \$159.95, it's got native drivers for most CD-RWs, which allows you to directly create backup CDs. USB and LPT support, plus even faster backup and restore times than Ghost 2001.

www.symantec.com



Key crazy

Is there such a thing as too many shortcut buttons on a keyboard? Just take a squiz at Logitech's new unit, which has buttons for Web browsing, wheels for scrolling and volume controls. Pop a music CD in your drive and you can even change tracks without using a mouse. The Internet Navigator Keyboard (\$79.95) isn't wireless, but it has nearly all the other features found in more expensive cordless keyboards.

www.logitech.com/cf



Microsoft Wireless IntelliMouse Explorer

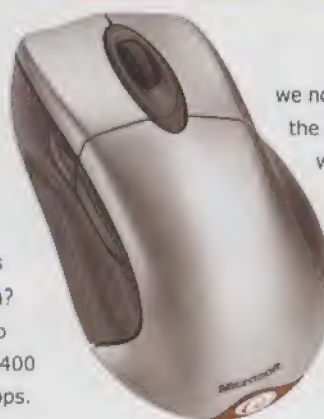
SLICK OPERATOR

Perhaps the coolest thing about optical mice is the tiny camera buried inside. Every time you move your arm, that little sucker goes crazy taking thousands of mini-snapshots of your desk. Neat, eh? Microsoft knows how cool this sounds, so they've upped the ante from the usual 2400 pictures per second to a ludicrous 6000pps.

The upshot is that you should get a more 'accurate' mouse, although it's probably not essential for everyday things like Web browsing. If you're a gamer though, odds are you'll want to get your hands on this baby, especially if you're mad about first-person shooters like Red Faction. More accuracy can only help your score, right?

There's also a new thumb groove added since Microsoft's original corded optical mouse in 1999, plus a button to switch radio channels in the unlikely event of interference.

The only real worry was a high pitched buzz



we noticed coming from two of the review mice we tested. This wasn't noticeable in a noisy office, but at home it could be enough to give some people a headache. Other optical mice don't seem to make this noise, so it could well be just a quirk with our test models — keep an eye out however. Like the Logitech optical cordless mouse we tested in June, the IntelliMouse might be awkward for left-handers. For the rest of us, it's one of the best ultra-comfy cordless mice available.

William Maher

Contact Microsoft
Phone 13 20 58
Online www.microsoft.com.au
Price check
Verdict ■■■■

Logitech Cordless Optical Mouse

SMOOTH OPERATOR

Logitech's forte is mice, and it shows. Their new cordless optical mouse is super-smooth and it's also a great choice for left-handers.

With the Logitech mouse, there's less effort to move the pointer around the screen. Sure, the Microsoft mouse (see above) has all the bells and whistles, but the Logitech is still a smoother ride.

What about accuracy? We couldn't see anything wrong with the Logitech's accuracy, even without Microsoft's special camera inside.

So does this mean Logitech beats Microsoft? For everyday Windows work, both mice will do fine.

This Logitech mouse only has two buttons, while the Intellimouse has four. You can put that down to the ambidextrous design. This is a much smaller mouse than Microsoft's; there's no comfy thumb groove like the Intellimouse, but at least it feels the same with your left and your right arm.

The Logitech mouse's other selling point is the specially trademarked WebWheel. Tap the



mouse's scroll wheel and a small menu with common Web buttons pops up. You can search the Web, reload a page, load favourites or jump to a pre-set Web site.

The Logitech is a little cheaper than the Microsoft mouse, although it's more expensive than ordinary mice that have a cord and a ball inside. However, if you're after a smooth ride, look no further.

William Maher

Contact Logitech Australia
Phone (02) 9972 3711
Online www.logitech.com
Price \$139.95
Verdict ■■■■



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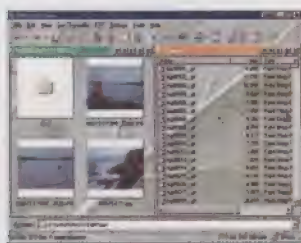
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File crazy

Why on earth would I bother replacing Windows Explorer? Customisation, of course! Directory Opus has enough configuration options to drive someone crazy, as well as in-built picture viewers and music players. Don't have Windows XP yet, but want to view files as thumbnails? Opus will do that too. The only problem is the price: \$149.95 seems very steep. Still, Opus has been around in various forms since the 1980s, so you should be getting a rock-solid product.

www.gpsoft.com.au

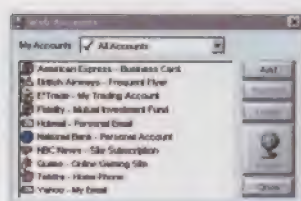


Open sesame

Enough passwords! If you're sick of dealing with a jumble of passwords for all your favourite Web sites, help is at hand.

AccountLogon (\$30 registration fee) takes care of all those pesky password boxes — to visit a Web site, just click once and AccountLogon takes care of the rest. Be careful though: if you forget the master password you will have to delete everything and start again.

www.accountlogon.com



NICE VIEW

Hercules, best known for its great range of video cards, has recently entered the market for flat-panel displays, and the results are impressive.

The ProphetView 720 is a 15in flat-panel display with photo-quality colour resolution, and is equipped with a native screen resolution of 1,024 x 768 pixels. On the right side of the display are the controls: power, auto-reset, menu and plus and minus keys for the menu system.

Installation of the unit is easy — it simply requires a driver for the display to be installed. A CD includes the appropriate Windows drivers and the set-up program will install the appropriate drivers for you.

Full-colour, greyscale and black-and-white images were crisp and clear at all resolutions. The greatest difficulty was that any text



Hercules ProphetView 720

displayed at a font size of less than eight points became very difficult to read, especially at 800 x 600 resolution. Games and full-screen movies were crisp and clear. The display refresh

rate was very impressive, and anything that required a sudden full-screen redraw left no residual images or ghosting.

The monitor also has an automatic facility which switches the machine off after a predetermined period of inactivity. The lightweight blue metal case was very nice touch. A high-quality entrant into the TFT screen market.

Richard Main

Contact: Guillemot Australia

Online: au.guillemot.com

Phone: (02) 8303 1818

Price: \$1,119

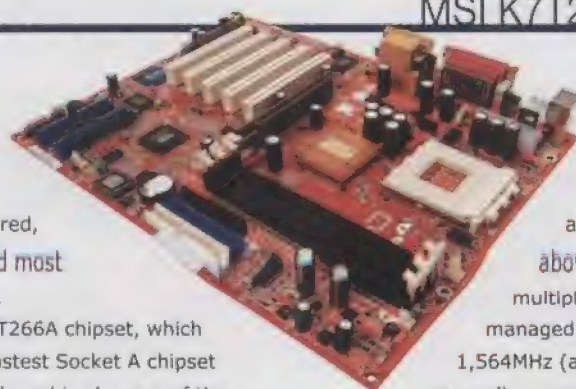
Verdict ■■■■

RED HOT

MSI's latest Socket A motherboard rocks. It's red, chocked with extras, and most importantly, fast as hell.

At its core is a VIA KT266A chipset, which is without a doubt the fastest Socket A chipset currently available. The board is also one of the first to offer Athlon XP support out of the box, and it's also backwards compatible with previous Athlon and Duron models.

MSI are also promoting the Pro2-RU as overclocker friendly, and it's got a great array of BIOS options for tweaking both RAM and CPU performance. We did a little overclocking of our own using two CPUs: an Athlon Thunderbird 1,333MHz (ATB) and an Athlon XP 1800+ at 1,533MHz (AXP). Unfortunately, our AXP is multiplier locked, so we're restricted to FSB overclocking. Still, we managed to get it running stable at 1,645MHz — roughly 7% faster, which is quite reasonable for FSB tweaking.



We had better luck with our Thunderbird, using a combination of the above method and

multiplier overclocking. We managed to push it up to 1,564MHz (an extra 17%). This is generally accepted to be around the maximum level you can push a

1,333MHz T-bird without hooking up a fandangled liquid nitrogen cooling system.

Overall, MSI have taken a great chipset and built a solid, feature-packed board around it. If you're an Athlon fan, they don't come much slicker than this.

Daniel Gardiner

Contact: MSI Computer

Phone: (02) 9748 0070

Online: www.msicomputer.com.au

Price: \$359

Verdict ■■■■



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www.microsoft.com/piracy/howtotell

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Ever wanted to stop would-be notebook thieves with an ear-piercing 94dB alarm siren? Designed effectively as a car alarm for notebooks, the Defcon 3 is a small device that's attached to your notebook bag with a stainless steel cable and controlled using a key-chain remote. You can choose from six different alarm sounds on the key-chain remote, though we won't hold our breaths for the downloadable ring tones. Available from Targus for \$110.

www.targus.com.au

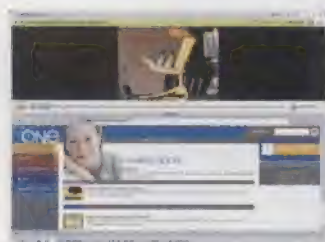


Better than the real thing

The Real One Real Player is designed to replace previous programs, such as RealJukebox and RealPlayer. RealOne combines the best of both, plus more.

There's hardly a file format that that RealOne cannot play, but can be configured to just play the RealMedia formats. You can also rip CDs and create content, or view other's efforts.

www.real.com



PLAIN AND PRACTICAL

If ever a digital camera could be mistaken for a conventional film camera, it's the Kodak EasyShare.

It has the shape and style of a bulky old holiday camera, with the same plastic feel and limited features. With 3.1-megapixel and 2160 x 1440 image resolution, photos will easily match familiar print-quality shots, while the 6x zoom lens (2x optical and 3x digital) and 35-70mm auto focus provide handy zoom for everyday occasions.

The DX3900 doesn't overwhelm with a clutter of buttons. The spin dial has just three action settings: camera, playback and setup. There's a familiar mono LCD panel that counts shots and registers picture settings, and a viewfinder to the left of the main LCD screen. You might end up turning to this eyepiece more and more because positioning subjects on the main LCD screen can be patchy with the DX3900's slow refresh.

However, the main screen's menu interface

is smooth and undemanding, with large icons and cool sliding thumbnails. It's

easy to retrieve image quality and size information, and even to zoom in on each pic. The 8Mb removable CompactFlash memory card can only hold seven shots at the highest (of five) image quality settings, and just 23 at the lowest.

The DX3900 cuts the confusion out of the creative world of digital photography, but at the cost of some of the features and fun.

Fiona Angus

Contact: Kodak

Phone: 1800 147 701

Online: www.Kodak.com.au

Price: \$1,399

Verdict: ■■■



Pioneer LCD PC PIII 1Ghz

COLOUR CLASH

The modish purple wrap and glossy silver cover of the Pioneer LCD PC PIII 1Ghz will stop any designer or stylist in their tracks.

But if second glances matter, this glamorous LCD spacesaver starts to look half-dressed. At first, you're bowled over by the stunning 15-inch TFT display, but then you start to notice details.

The mouse is a standard plastic beige two-button PS/2 affair and the silver keyboard has a slightly different colour and texture to the PC.

The overall impression is trashy and try-hard.

Its saving grace is its price. At \$2,999, it makes showroom-class LCD technology accessible to those still stuck with a boring beige box.

The Intel PIII 1GHz chip, 256Mb of RAM and 20Gb hard drive speed through everyday

tasks, and it doesn't skimp on extras. There's a floppy drive and a PC card slot, along with two USB ports and a FireWire port.

The surprising touches continue on the side of the screen, where the sound and brightness controls are tucked away alongside the headphone, microphone and line-in sockets. The base swivels from left to right, and the monitor tilts back on a hinge (watch out when clipping CDs into the drive on the side of the monitor -- it makes the entire screen wobble).

But if staging and design are what you want (and who doesn't?), then the Pioneer LCD needs a little more grooming.

Fiona Angus

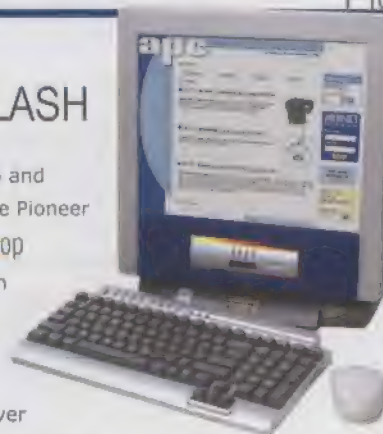
Contact: Pioneer

Phone: 02 9690 2888

Online: www.pioneercomputers.com.au

Price: \$2,999

Verdict: ■■■



I can...



Reduced operating costs.

A Super Economy mode vastly improves operating economy without the definition sacrifices common to so many draft modes. It effectively quadruples output from both the black and colour cartridges.¹

...fit even the tightest budget.

Brilliant plain paper photo quality, automatically.

A selectable function called Photo Optimiser is included in the printer control software. It automatically adjusts for defects in exposure, highlights and shadows, and prints accordingly with standard inks designed to optimise quality on low-cost plain paper.



High quality blacks at high speed.

The optional high capacity black ink cartridge uses 64 print nozzles for high print speeds. The selectable text smoothing mode goes up to 720 dpi to maximise text quality.



Optional BC-03 black ink cartridge.

BJC™-1000SP

colour Bubble Jet™ printer

Just \$129^{RM}

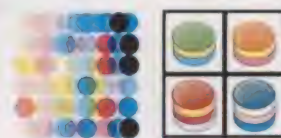


Better Internet images.

Image Optimiser, a printer control software feature, automatically "corrects" low-resolution images up to the printer's maximum resolution.

Superior photographic reproduction.

The optional PhotoRealism™ cartridge is ideal for high resolution papers. Low-density inks vary colour saturation per dot to dramatically increase the colour combinations, reduce grain and smooth tones.



PhotoRealism produces colours between colours.

Canon Customer Care.

The one-year warranty is upgradeable to three years for a minimal charge, and is backed by Customer Care hot-line support. For more information call 1800 021 167.



You can...

Canon

WHAT'S THE DEAL?

HAD A RAW DEAL? STUCK WITH A LEMON? WATCHDOG TAKES UP THE FIGHT FOR YOUR CONSUMER RIGHTS.



DOMAIN HIJACKING

Bob Tudor from Greensborough in Victoria knew something funny was up when he tried to visit Adelong Computers Online and mysteriously found himself at **www.estore.com.au**. "Is E-Store pulling a fast one?" he asked Watchdog.

E-Store seemed to be redirecting Web traffic from Adelong.com, Adelong.net and even Adelong.org to its own Web site. "It came as a shock to us," Adelong managing director Julian Kang said. He was busy trying to reassure customers that Adelong had not gone broke or sold out to E-Store.

It turned out that Adelong had accidentally let the domain registration lapse when the employee in charge of the Web address left the company and the registrar did not update the contact details at Adelong's request. Ten days after a deactivation letter was sent to the former staff member, E-Store registered the names.

E-Store managing director Steven Spilly was listed as the new administrator of the

When Watchdog revealed the problems our readers were experiencing with E-Store in September, we were flooded with letters from others burned by this self-proclaimed "world-class online shopping facility".

A typical story goes like this: Glenn Staff from Canberra spent \$685 on a Mitsubishi 19in monitor and Microsoft joystick. He was promised delivery within seven days, but was still waiting 12 days later. "I sent an email to customer service but all I got was a reply stating that they were out of stock for another week. This is despite the fact that when I ordered my goods, both were in stock. Every email I have sent gets what seems to be an automatically generated reply. I have tried ringing the company, only to find out that email is their only form of communication."

Glenn then told E-Store he would be contacting Watchdog and the NSW Department of Fair Trading. E-Store

domains on behalf of E-Store. Watchdog tried to phone and email E-Store to find out more, but received no response.

Adelong's marketing director Richard Yeadon was placed in charge of getting the names back. "I contacted Steven Spilly directly. When I asked him why he registered the names, he said they were planning to open a retail outlet in Adelong NSW. Now, Adelong is a town with around 100 families, so I don't think his business would stay open very long."

Yeadon was later informed that the names were for sale, but was unable to find out anything further.

"As best I can work out, he's just using it to redirect traffic to **www.estore.com.au**," he said. "Personally, I think he must be desperate to actively go out and attain the domains of competitors and redirect them."

He began preparing a case to put before the World Intellectual Property Organisation (WIPO) to force E-Store to return the names.

immediately replied to his email, but when he asked to speak to someone, he was told "we do not offer telephone support".

However, his threat seemed to work because the next day, his joystick and an alternative ViewSonic monitor arrived on his doorstep. "I'd warn people to be very careful," he said.

The warning came too late for James Kenna of Burnie in Tasmania. He ordered the same Mitsubishi monitor two days before Glenn did, but never received anything. "The advertised price was the lowest I could find, and the Web site indicated that the product was in stock," he said.

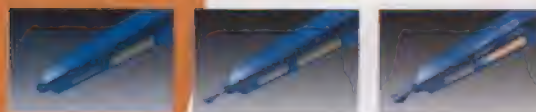
When it didn't arrive, he fired off an email. "I was informed two days later that this monitor was out of stock, and new stock was expected next week." He got a nasty shock when, still no monitor in sight, he noticed E-Store had charged his credit card. "I faxed the company a letter of complaint, but I never received

Adelong.com.au has always been Adelong Computers' primary domain, but Yeadon sees pursuing the other addresses as necessary to protecting the Adelong name. "We only registered Adelong.com because a lot of inexperienced net users try it first," he said. "We've spent a lot on marketing to have someone else profit. We're a registered company with a registered logo and strong ties to the name. We think we have a strong case."

Since E-Store went into voluntary administration, Yeadon has put the WIPO case on ice and is trying to negotiate with the administrator to get the names back. At one stage, E-Store offered to return the names if he got Watchdog to abandon the story, he said.

Meanwhile, did E-Store's siphoning strategy work? "I did browse the site, but found the prices somewhat more expensive than at Adelong," Bob Tudor told us.

I can...



Exceptional results, easily.

The inks are optimised for plain paper. Quality can be automatically enhanced with Drop Modulation Technology™ with variable drop sizes. These are placed in any of five combinations to smooth colour gradations and improve tonal quality.

...get exceptional quality, very affordably.



Better internet images, special effects.

Image Optimiser can automatically "correct" low-resolution Internet images up to the printer's maximum resolution. Turn photos into simulated illustrations and create sepia hues, print banners up to 6 A4 pages long, overheads and even T-shirt transfers.



Duplexing, high speed blacks.

The driver allows manual duplex. For B&W only, an optional dedicated black ink cartridge with 128 print nozzles offers print speeds up to 5 pages per minute.¹



Reduced operating costs.

Super Economy mode improves operating economy without the definition sacrifices common to many draft modes. It effectively quadruples output from both the black and colour cartridges.¹

5 times the colour.

Optional PhotoRealism™ inks vary the saturation per dot. This produces up to five times as many colour combinations as conventional CMYK inks for better half-tones and less grain.

PhotoRealism produces colours between colours.



Built-in parallel and USB interfaces for Windows and Mac.²



BJC™-2100SP

colour Bubble Jet™ printer.

Just \$169^{msrp}

Canon Customer Care.

The one-year warranty is upgradeable to three years for a minimal charge, and is backed by Customer Care hot-line support. For more information call 1800 021 167.



You can...

Canon

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my monitor or any correspondence from E-Store about the delay."

Watchdog tried to contact E-Store, but its customer service and office numbers were diverted to a recorded message. When we clicked on the Westpac secure payment authentication sign on E-Store's home page to verify it was legitimate, a message popped up stating that it was no longer valid.

Westpac spokesperson Julia Quinn told Watchdog that the bank no longer provides certification for E-Store and has demanded the company remove the sign. "We terminated the relationship after receiving a significant number of complaints from customers," she said. On the same day that Westpac withdrew its support, E-Store was placed into voluntary administration.

This was bad news for James. "I don't think I'll get the monitor now," he said. "The only reason I went through E-Store was because I thought they were reputable. It really annoys me that they charged my credit card when they didn't have it in stock. I feel a bit burned by this. They have \$600 of mine — which I could have been earning interest on."

James was a Westpac customer, so he began proceedings to have the transaction reversed. "I'm disappointed that they have gone into voluntary administration and still appear to be taking orders on the Web site."

Watchdog contacted accounting firm Star Dean-Willcocks, where Ian Purchas had just been appointed a joint administrator for E-Store. He was attempting to broker a deed of company arrangement that would allow E-Store to stay in business. At the time, he believed this was the best way for creditors (including customers) to get their money back: "The Web site is still up and is continuing to trade," he said. He blamed E-Store's collapse on cash-flow problems. "There was a downturn in consumer demand. Up until recently, the company was trading quite

successfully." Customers who paid by credit card (he estimates that around 90% did so) are protected under the consumer credit code, so their bank will end up carrying any debts.

But those who paid upfront, like Jason Bowden of Newcastle, face becoming an individual creditor of the company. Bowden didn't want to disclose his credit card details on the Web when he bought a Canon printer and scanner, so he used BPay. "They have \$850 of mine and I have nothing to show for it," he said.

"That money would have been much better off sitting on my home loan instead of earning interest for a company which obviously does not deserve to be in business." Luckily, he had actually charged the BPay transaction to his credit card. He immediately contacted ANZ to get the transaction reversed.

Like James Kenna, Jason must go through a lengthy credit card charge-back process. As an ANZ customer, he must wait 30 days (45 for overseas etailers) after the agreed delivery date has passed and then fill out a special "dispute pack". According to ANZ spokesperson Paul Edwards, he must sign a declaration that he hasn't received the goods, which ANZ then weighs against information provided by the retailer. The bank investigates the evidence and if the retailer is proven right, Jason will be slugged with a \$10 fee on top of the original charge.

"I do not believe that I will be doing any more Internet shopping based on this experience," Jason said. ■

CONTACT US

WE WANT TO KNOW

how IT companies are really treating you. Write to: watchdog@acpmag.com or PO Box 4088, Sydney NSW 1028. Include your contact details and product information. All correspondence becomes the property of APC and is subject to editing.

DON'T GET BURNED: TIPS FOR STAYING SAFE IN THE CHRISTMAS ONLINE SHOPPING RUSH

It looks like the perfect Christmas gift and with the promise of speedy delivery it seems like a hassle-free shopping experience. It's very tempting, but be careful; the season of goodwill is no time to get burned by dodgy etailers who drag their feet and cut corners.

If you see a must-have Christmas gift on a Web site, ring the 1800 customer service number and check it's actually in stock (no matter what the Web site says) and will definitely arrive sometime *before* the Christmas tree starts to go brown.

Only deal with reputable merchants — not faceless Web sites. Verify the company's contact details and Australian business number and double-check the Web site authentication signs.

Once you've confirmed delivery dates on the phone, carefully document your order details, along with the time you called and person you spoke to. Make sure your electronic receipt is correctly dated and includes the delivery timeframe as well as complete product details.

If an etailer finds any of this difficult, cancel the order or proceed at your own risk! Most online shoppers use their credit card because they're protected under the consumer credit code. If you pay upfront using BPay or cheque, it's harder to reverse the transaction.

If your goods don't arrive in the promised timeframe, ring and ask why. Don't delay. If they don't have a good answer, ask to cancel the order (you don't have to accept excuses that begin with "Our supplier . . .").

If you do run into trouble, contact your bank and arrange a charge back on your credit card on the grounds that the goods were not delivered as agreed. That's when you'll need all your documentation to prove that the transaction didn't go ahead as promised.

The best way to discover whether you really can depend on an etailer is to talk to other customers who were satisfied with their service. Watchdog has seen bad things happen to smart people, so we know there is no magic solution that will keep you safe online.

But we do love receiving letters from readers who are so happy with the speedy delivery from their favourite etailer that they feel compelled to send us recommendations.

Watchdog wishes you a happy and hassle-free Christmas!

I can...

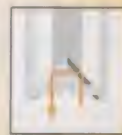


The inks come in separately replaceable transparent ink tanks, and each is separate from the print head.

The printer driver alerts you when inks are low allowing you to replace only one colour at a time, keeping operating costs down. Plus, Super Economy Mode saves you even more money by cutting ink consumption.



Light



Light

Smart monitoring system.

...print brilliantly, and save you money.

1440 dpi, variable ink drop sizes.

Quality is exceptional, even on low cost plain paper with resolution up to 1440 x 720 dpi, plus Drop Modulation Technology™ with variable ink drop sizes. B&W is enhanced using high optical density black pigment inks.



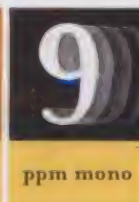
Optional PhotoRealism.™

Special inks vary the saturation level per dot (e.g. 33%, 67%) for up to 5 times as many colour combinations as conventional



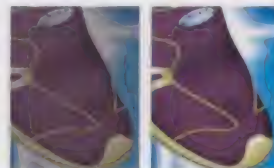
CMYK inks. The result is smoother tones with vastly reduced grain.

PhotoRealism produces colours between colours.



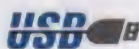
High speed printing.

Large print heads and bi-directional printing produce up to 4 colour pages per minute. An optional, dedicated black ink cartridge is capable of B&W speeds up to 9 pages per minute.²



Parallel and USB interface.

Both ports are built-in for Windows and Macintosh.¹



Turn your printer into a 720 dpi colour scanner with the optional scanner cartridge, pictured left.

Canon Customer Care. The one-year warranty is upgradeable to three years for a minimal charge, and is backed by Customer Care hot-line support. For more information call 1800 021 167.



S400SP

colour Bubble Jet™ printer

Just \$259^{RRP}

You can...

Canon

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FEEDBACK LOOP



A MESSAGE FROM YOUR FRIENDLY TECHIE

I work in technical support for an ISP (I won't mention which one) and on most calls, I am bombarded with threats of violence. I can assure you that we are always working to improve service levels. However, it takes time to train people to provide the right advice and assistance. Some calls may be simple password changes which take all of three minutes, while others may need a 45-minute walk-through to have their dialup networking reinstalled. Despite what you might think, we're not lying when we say the problem may be with your computer. The fact is, most problems with the Internet relate to settings or corrupted files on a user's PC. If the problem lay with our equipment, we'd tell you. Here are a few hints that will make your experience with your tech support department much more enjoyable.

- Know what the problem is. If you receive an error message, write it down! Telling us you "can't connect" gives us no clue. There are hundreds of dialup error messages in Windows.
- If you have trouble browsing, check other programs like email, ICQ or MSN Messenger. If it's just Internet Explorer, then it may be a proxy setting. If nothing works, it may be the network protocols

or a problem at our end. The more you try before you ring, the more quickly we can get to the root of the problem.

- Shut down and restart. Most problems are one-off, and simply restarting the PC will fix it.
- Be at your PC. I can't stress this enough — it's hard to help you if you have to run back and forth from the PC.
- Have your Windows CD at hand. Often we may need to replace certain files, and without the CD we can't do it.
- Know your username and password. You'd be surprised at how many people have no idea what they log in with.
- Don't yell and scream at us. We're here to help — that's our job. We're much more likely to be able to be of assistance if you remain calm.

**Jarrold Hassell
Highton, Victoria**

This is an edited version of a posting on www.apcmag.com.

MOBILE MANIA

The addition of mobile phone reviews to the magazine is very welcome, and most timely with the convergence of handhelds and mobiles. But those of us who travel overseas need to know which bands each mobile operates on. I often travel to the US and am limited to using a tri-band phone that will operate on the 1900 GSM band as well as 900 and 1800 bands. Until now, I have only found one tri-band phone on the Australian market — the Motorola L series. I'm overdue to replace my Motorola L, but keep waiting for someone to bring out a combined tri-band and handheld. In a world shrinking with travel and globalisation, I'm amazed that there are so few options.

**Phil Auckland
Windsor, Qld**

BITS AND BYTES

I enjoyed reading the November issue, but I must take issue with APC's decision to mimic a disturbing trend filtering through the IT industry. It concerns the abbreviations used to describe storage capacity and transfer rates. When using abbreviations such as Kb and Mb, the lowercase "b" means "bit", whereas "B" means "byte". It is technically incorrect to state that a 20-gigabyte hard drive has a capacity of 20Gb. A lot of people I know are getting around this issue by using "Gbit" or "Gbyte" to differentiate. However, a magazine such as yours, which prides itself on technical accuracy, should not be falling into traps such as these. A case in point is your article entitled "Card Tricks" (APC November, page 156). Since you don't differentiate correctly, it's impossible to know whether the cards are transferring data at 10Mbits per second, or 10Mbytes per second. Please guys, can you ensure technical accuracy and follow established standards when referring to capacities and transfer rates?

**Scott Marshall
Swinger Hill, ACT**

SCOTT'S LETTER CAUSED MUCH DEBATE AT APC! We're constantly wrestling with style issues and the MB/Mb battle is a longstanding one. After the paramedics left, the consensus was that Scott had a point... So, from here on in, our style will be thus: megabyte = MB; Megabit = Mbit. For triggering such a momentous change, Scott wins a copy of Microsoft Office XP, with the latest 2002 versions of Word, Excel, Outlook, PowerPoint and Access.



I can...



Super fast, fast mode.

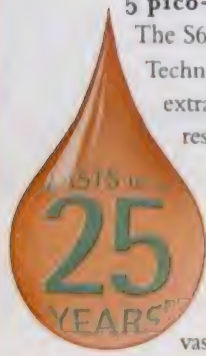
A special fast mode combines an extra large print head capable of up to 12 million ink ejections per second with four drive motors. The paper feed is up to 70% faster, and is enhanced by a 20% greater data compression ratio. This allows fast mode to print up to 15 monochrome pages (text), and up to 10 colour pages per minute.¹



...print up to 15 B&W pages per minute.

5 pico-litre drops for 2400 dpi.

The S600 uses MicroFine Droplet Technology to precision-place extraordinarily small ink drops at resolutions up to 2400 x 1200 dpi.



Better colours that last longer.

The S600 inks produce more vivid colours for improved reproduction on plain paper, and deliver sharper, blacker rendering of monochrome text. The ink range also offers vastly improved light fastness. In a simulated fading test, they have been shown to last up to 25 years using ISO standards for levels of acceptable fading when printed on Canon Photo Paper Pro.²



Resolves speed vs. quality issues.

The S600 also features a special draft mode. Slightly slower than fast mode, it combines high speed, with ink conservation, while resolving the quality issue common to conventional draft modes. New head design and Precision Colour Distribution Technology improve colour consistency while producing high-density, high contrast prints and still achieving B&W speeds up to 12ppm.¹

Smart ink monitoring.

Inks are contained in separately replaceable transparent ink tanks, and each is separate from the print head. The monitoring system alerts you when they are low, so you replace only one colour at a time.



S600

colour Bubble Jet™ printer

Just \$599^{***}



Parallel and USB interfaces are built-in for Windows and Macintosh.³

Canon Customer Care. The one-year warranty is upgradeable to three years for a minimal charge, and is backed by Customer Care hot-line support. For more information call 1800 021 167.



You can...

Canon

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CC: OPINIONS

CRUISE WINNER:

I WANT MY LCD

I want an LCD screen. Why? Is it the smaller size? The better power consumption? Well, yes. But the main reason is the low radiation output compared to CRT monitors. I'm 20 years old and just finishing my BSc in Computer Science at the University of Tasmania. I intend to work permanently in the IT field, but too much radiation over a long time can't be good for my health. Combine this with the arrival of wireless networking (although it's not proven whether this could do harm), and the amount of electromagnetics I'm being exposed to becomes even greater. Bring on the LCD!

Nick Read
Hobart, Tas

THE REAL WORLD

APC readers must surely be tiring of the same old platitudes ("blazing speed", "next killer app", "time to upgrade") that are wheeled out each month to describe the latest gizmos. I bought Acrobat 5.0

We welcome comments and suggestions. Send correspondence to:

APC Readers' Say, PO Box 4088, Sydney NSW 1028, or email apc@apcmag.com

Letters can also be submitted online at apcmag.com. All correspondence becomes the property of APC and is subject to editing.

HOW TO CONTACT US

after reading your favourable review (APC June, page 42), but I soon regretted it. With my combination of Office 97 and W2K, my reports frequently fail to convert and there are serious graphics and HTML conversion issues. I suggest you solicit panel comments from folk who are up on the limits in current versions. We need to know whether these things work in real life, not just in the APC Labs.

John Burton
Thursday Island, Qld ■

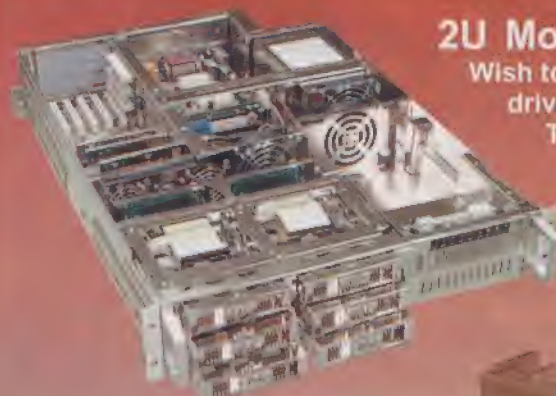
THE LUCKY WINNER OF OUR October subscriptions promotion is P Bettels of Melbourne, Vic. Congratulations, you've won a luxury Mediterranean cruise package, valued at \$25,000!

The image shows the cover of APC magazine. The top half features a collage of images related to a cruise holiday, including a ship, a person relaxing, and a tropical beach. The text 'SUBSCRIBE AND WIN THE ULTIMATE CRUISE HOLIDAY' is prominently displayed. The APC logo is visible, along with a price tag of '\$79'. The bottom half of the cover shows a large cruise ship sailing on the ocean.

SUBSCRIPTION PRIZE



Maxtron 19" Industrial Rackmount Chassis



2U Modularised RAID Server Chassis:

Wish to offer your customers the maximum hot swappable drive bays while restricted by the available space?

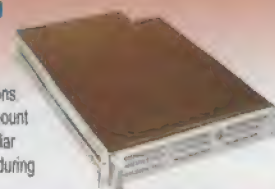
Think about Maxtron 2U Modularised RAID Server Chassis which offers you flexible configurations on the system. With the ability to upgrade your system from a basic one to the most complex RAID server, Maxtron Rackmount Chassis gives you the best way to upgrade as your customer's requirements change.

Visit: www.digicor.com.au



Maxtron 2U Rackmount Modularised RAID Server Chassis

Digicor is committed to providing total Rackmount solutions. We offer a comprehensive range to cater for any Rackmount requirements. For more details or to discuss your particular Rackmount applications, please contact our sales team during business hours.



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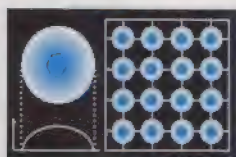
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I can...

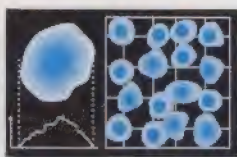


...print photos with **zero**
discernable **grain.**

High precision dot control.



S800.



Lower-level technologies.

Smaller, better ink droplets.

A unique Canon process called MicroFine Droplet Technology™ uses 4 pico-litre ink drops. A special star shaped nozzle creates near perfectly round, centre weighted droplets for more accurate placement.



Star shaped nozzle.



SuperPhoto mode, 49 tonal levels.

In SuperPhoto mode the S800 can print up to 42 ink droplets per pixel. This allows the printer to achieve 49 tonal levels with zero graininess, even in highlights or gradations where dots are normally distinguishable.

Extra large print heads with 6 separate ink tanks.

There are 256 print nozzles per colour on the print head. Separately replaceable, transparent ink tanks and a smart monitoring system help maximise operating economy.



Separate ink tanks.

2400 dpi, super low density ink.

The S800 uses a 1200 dpi nozzle with interleaved printing to achieve 2400 x 1200 dpi. Special low-density inks are approximately 1/6 the density of normal inks. These have an apparent dot size equal to 0.67pl of regular ink.

2400

dpi plus Microfine
Droplet Technology



Parallel and USB interface for
Windows and Mac.

Canon Customer Care.

The one-year warranty is upgradeable to three years for a minimal charge, and is backed by Customer Care hot-line support. For more information call 1800 021 167.




S800
colour Bubble Jet™ printer
Just \$649**

You can...

Canon

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CS0445/6



PRÊT-A-PORT

They're slim and good-looking, and you can take them anywhere. We mean the new portables, naturally.



ABLE

BY FIONA ANGUS

SLIM, SEXY, POWERFUL, PORTABLE. APC FINDS EVERYTHING YOU NEED TO KNOW ABOUT STAYING CONNECTED ON THE ROAD, PLUS PUTS SEVEN TOP SLIMLINE NOTEBOOKS THROUGH THE LABS.

A Slimline isn't just a really small notebook. "Portable" no longer means trying to cram the power of your desktop into a smaller plastic box. You already have everything you want in a PC — now you want to take it with you.

A slimline is meant to be a gateway to your home PC or server from anywhere in the world. Take the Fujitsu LifeBook S-series. It's got enough speed and space to handle everyday tasks, with a tonne of matching add-ons if you want more. But it's the *feel* of the silky keyboard and case as you hold it in the palm of your hand that makes it so incredibly seductive.

The hardware may be flawless, but is the world ready to let you utilise the capabilities of these roving digital hubs? Staying connected on the road has always been just on the horizon for the weary traveller, and without this support, a slimline is little more than a puny PC. APC took seven of the latest slimline notebooks and our sense of adventure and hit the road to discover if they really can keep you in touch on the go.

COME FLY WITH ME

It's 5.30pm in Sydney and 11.30pm at the Qantas check-in in the Los Angeles international airport. The hostie raises an eyebrow at a bulging Toshiba notebook shoulder bag. "I'm sorry," he says. "But you've exceeded your cabin baggage allowance."

Even without the corner of the chunky adaptor straining the side zip and a few unwanted floppy disks, it barely makes it on board.

Not so long ago, it was easier to get fresh food through customs than take a notebook on a plane trip. A full-size notebook is heavy, bulky, power-hungry and a general pain for anyone within a two-metre radius in an airport or hotel. An iBook, a Vaio or a Portege are all slight enough to cause no troubles on long trips, but is the road ready to take advantage of what these fabulous communications showpieces can do?

Everyone knows notebooks cause electromagnetic interference with cockpit navigation and plane communications systems during take-off and landing. But once you pass 3,000 metres, the safety signs go off and you're free to work or play.

You're no longer limited by the life of your battery. About 10 minutes after taking off on any Qantas flight, the hostie cranks up the in-seat notebook power on every armrest in first and business class. The socket has a 15-volt DC output, but you have to have the right adaptor and connector cable (you can buy the Targus Universal Adapter onboard until late February).

On a Singapore Airlines flight, you're bombarded with the



APC TOOK SEVEN OF THE LATEST SLIMLINE NOTEBOOKS AND OUR SENSE OF ADVENTURE AND HIT THE ROAD TO DISCOVER IF THEY REALLY CAN KEEP YOU IN TOUCH ON THE GO.

latest technology and Nintendo games through a 14-inch screen in the back of each seat, and there's a notebook power socket (you might have to buy an adaptor in-flight) on a long-haul 747 jumbo to Europe or a 777 to Asia. Notebook power sockets are generally standard in business class on all 747 long-haul flights, but battery power could be called for on short hops and Atlantic crossings. You could also be stranded without the right adaptor if you're reluctant to pay around \$200 to get the right one on the spot.

When it comes to Internet and email on a plane, chances are you'll also be disconnected. Most airlines are still working on allowing easy Internet access for notebooks across their fleets. Some older and smaller planes aren't wired, so what you end up with really depends on whether the gods are smiling up at you that day.

There's no standard way to connect to the Net across the different commercial airlines. Some systems patch you through to an onboard proxy server and then through to a satellite network, while others are integrated into the phone system installed on the plane. So even if you're lucky enough to be on a flight with a data port, you may have to master the proprietary technology, download software and wade through a tedious registration process.

Singapore Airlines has a partnership with Tenzing Communications, a US company that's building and operating proprietary Internet systems in commercial aircraft. United Airlines has flights where you can plug your modem cord into what it calls an Airfone, which can send emails at 9,600bps.

Many of these airlines' long-haul aircraft are dotted with these proprietary communications systems. They can be hard to use and cost the earth. Until the technology gets better, planes are really a

I can...



A smart ink monitoring system alerts users when a colour is running low. Individual transparent ink tanks for all colours are separate from the print heads, significantly reducing operating costs and allowing you to replace only the empty tank.



...print A3 pages in 1440 dpi.

1440 dpi, variable ink drop sizes.

Quality is exceptional, even on low cost plain paper, with resolution up to 1440 x 720 dpi plus Drop Modulation Technology™ with variable ink drop sizes.



Absolutely brilliant colours.

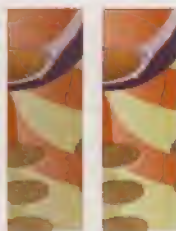
High optical density inks offer better, more vivid colours than ever before. The standard inks are optimised for superior plain paper quality. Black ink tanks feature high optical density black pigment ink.

6-colour system for better photos.

Optional PhotoRealism is ideal for photographic reproduction on higher paper grades. Colours are amazingly life like with smooth tonal gradations, reduced pixelisation and more colour combinations.



Separate ink tanks.



Better print quality automatically.

Photo Optimiser PRO adjusts for defects in exposure, lighting and colour while Automatic Tone Control reduces the colour noise from digital camera images. Image Optimiser prints low resolution Internet images up to the maximum resolution supported by the printer.

Fastest in its class.

Dual print heads combine with bi-directional printing to deliver text speeds up to 9 A4 pages per minute and colour up to 6 A4 pages per minute.¹



Windows/Mac compatible. Built-in Parallel and USB interfaces offer support for Windows, and Mac OS 8.1+ or 9.X.²



\$4500

colour Bubble Jet™ printer

Just \$699^{RRP}



An optional scanner cartridge delivers resolution up to 720 dpi.

Canon Customer Care. The one-year warranty is upgradeable to three years for a minimal charge, and is backed by Customer Care hot-line support. For more information call 1800 021 167.



You can...

Canon

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**A NOTEBOOK BAG
SHOULD NEVER
LOOK LIKE A
NOTEBOOK BAG**



chance to recoup and review data in between downloads. Perhaps put your digital photos in order, watch a DVD or listen to MP3s — you no longer have to rely on the patchy in-flight entertainment.

TOUCHDOWN

After disembarking, you'll find the airport awash with casual Net kiosks. There's no better way of keeping bored backpackers happy than hooking them up to Hotmail. But for notebook users, Net kiosks and cafes won't do.

Head straight for the airport lounge to hook up your notebook. The Qantas Club will have a bank of notebook stations ready to

recharge for the flight ahead. Use your inbuilt modem to dial up the Net through the standard phone port (local calls only!) in each bay.

Join the corporate crowd logging on to their VPNs (virtual private networks) either by dialling a direct number to their server (which might then link up to a server overseas) or through a Web-based software system and special dialup code. Without your own dialup number, you'll be lining up to use the Qantas Internet café-style desktop machines. Smart travellers keep an account with a national ISP like OzEmail or Telstra (and a list of regional dialup numbers) and just dial up from any Australian city.

You don't have to stay chained to a notebook bay. If there's still

I can...



BJC-55.
Ultra small, ultra light, including Li-ion battery. Weighing only 900 grams, the BJC-55 is approximately 1/2 the size and weight of the BJC-85. Using the included battery and IrDA interface it is capable of cordless communications out of the box. An international AC power adaptor is also included.

BJC™-55
colour Bubble Jet™ printer
Just \$649*

...fit in a briefcase.

PORTABLE PRINTER CHECK LIST

IrDA for totally
cordless operation.



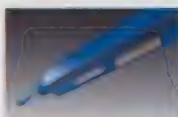
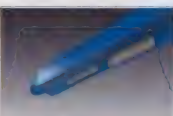
High speed black.



Optional colour scanner
cartridge for images, fax
and OCR.¹



Four-colour print head.



Drop Modulation Technology.

Both fit into a briefcase.



USB interface included
with both models.²

USB



Canon Customer Care. The one-year warranty is upgradeable to three years for a minimal charge, and is backed by Customer Care hot-line support. For more information call 1800 021 167.

BJC™-85
colour Bubble Jet™ printer
Just \$429^{FRP}

BJC-85.
Super powerful portable
printer, international
adaptor standard.

It fits easily into a briefcase, but offers desktop quality and flexibility. An international power adaptor is standard and a sheet feeder is built-in. IrDA 1.1 plus parallel and USB interfaces are standard.³ A long-life NiMH battery kit is available as an option.⁴

Exceptional colour, optional PhotoRealism.

Using standard inks optimised for plain paper, both printers automatically print high quality images using Drop Modulation Technology™ with variable ink drop sizes. The optional PhotoRealism inks offer exceptional photographic printing.

High speed black and white.

A four colour print head with resolution up to 720 x 360 dpi comes as standard. Both printers accept an optional dedicated black ink cartridge with 128 print nozzles for print speeds up to 5 ppm.⁴

You can...

Canon

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**FORGET THE POST: EMAIL YOUR OWN
DIGITAL POSTCARDS ON THE ROAD.**



a little battery life in you yet, stretch out on a couch or sit down for a meal and surf the Net through the wireless network.

All the Australian Qantas (and Wellington International) Club lounges have high-speed wireless Net access provided by SkyNetGlobal. A wireless PCMCIA card (either standard or a slot in new notebooks) will pick up a signal from one of two hubs covering the Club area. If you don't have your own card, the front desk will lend you one for free if you leave your boarding pass as security.

You should automatically pick up the network signal without having to mess around with settings too much (and there's help at hand if you do). Log on and download software that will take your credit card details and give you a password. Under the casual plan, it costs 20c per minute (with a 25MB download limit per hour), but if you spend half your life in lounges you can sign up for a (pricey) long-term subscription.

Once past the first level of secure password authentication, you're free to surf, but you're also vulnerable to any security problems that come with braving a public wireless network. On an open wireless network, no one can tell if the guy sitting across from you is replicating stock quotes or hacking into your system. Brisbane International Airport is completely covered by a wireless network, so you can't even suss out the others in the lounge.

SkyNetGlobal recommends that every notebook should have a personal firewall, but leaves security up to you. "We don't tell you how to create security," says Michael Bourne from SkyNetGlobal. "Our network is a vanilla flavour and you bring whatever flavour

I can...

N670U



Push button simplicity.
Three scan buttons activate ScanGear Toolbox CS (the scanner control software). It lets you select functions and the final destination of your scan such as colour printout (copy), e-mail program, fax, or others.¹



N676U



...scan up to
600 x 1200 dpi,
with each of these scanners.

Patented LIDE™ technology.

Both scanners deliver optical resolution up to 600 x 1200 dpi, while the universal TWAIN driver offers enhanced resolution up to 9600 dpi.



An improved 48-bit input process.
Offers excellent colour fidelity, and creates images with smoother gradations as well as a greater amount of shadow and highlight detail.

48
bit input

Plug 'n play USB for Windows and Mac.

The USB interface is compatible with Windows 98/Me/2000 and Mac OS 8.5 or higher.² And, because the scanner is powered directly through the USB cable, it does not need a separate AC cable.



Edit and store photos easily.

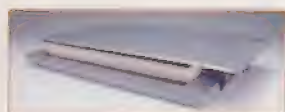
ArcSoft PhotoStudio 2000 is an easy-to-use image editor, and ArcSoft PhotoBase creates photo databases. Electronic manuals for Windows and Mac are included.

CanoScan™
N 676U
Just \$229^{RRP}



You can also stand up the unit to make room on your desk, and still use it to scan at any time, taking colour scanning to a new level of quality and convenience.

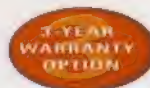
CanoScan™
N 670U
Just \$199^{RRP}



"Z-lid" simplifies book scanning.

This special lid simplifies book scanning and OCR with the bundled Caere OmniPage Pro³ converting scanned text into editable data.

Canon Customer Care. The one-year warranty is upgradeable to three years for a minimal charge, and is backed by Customer Care hot-line support. For more information call 1800 021 167.



You can...

Canon

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CS0669



THE PAPER-THIN
SHARP PC-UM10 IS
THE ULTIMATE
SLIMLINE NOTEBOOK.



or level of security you want." That means locking down notebook security settings before leaving home.

You'll notice more and more wireless hubs appearing on the walls and ceilings of airport lounges and public spaces (including Qantas lounges in the US and Asia). Rydges Hotels in Sydney, Melbourne, Perth, Brisbane and Canberra have wireless networks, and with the IEEE 802.11 wireless networking technology now standard around the world, you'll be walking through these networks so often it's a shame not to try one out. However, at the moment you won't get much further than the airport.

CHECKING IN

Net access in hotels is a lot like the mini-bar: you can use the ultra-expensive selection on offer or prepare your own dial-up numbers before you leave home.

The rip-off option seems fairly popular. On any given night at the Hotel Inter-Continental Sydney, between 5% and 8% of guests log into the hotel's proxy server using their notebooks. The standard 128Kbps ISDN connection costs a whopping 50 cents per minute.

Most of the notebook travellers that IT manager Ben Wrigley sees have their own dial-in numbers. Even if you never use a hotel

I can...



Push for film scanning



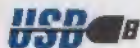
Scans 35 mm film in slides, and strips in positive and negative format.

Push for photo scanning



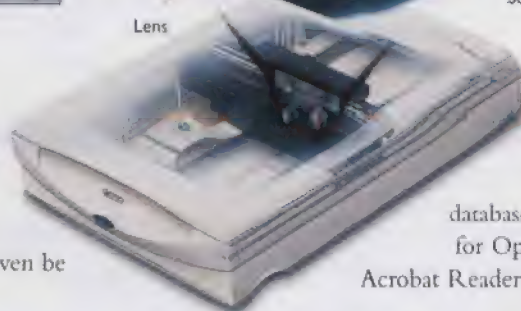
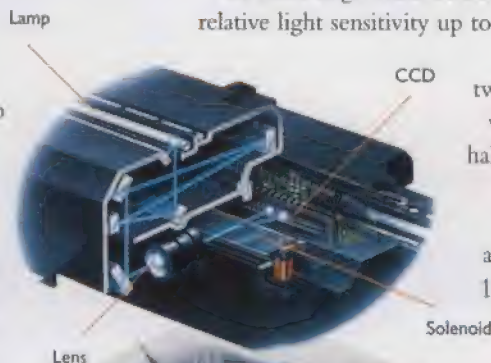
Easy to use, with USB.

The CanoScan™ D660U solves diverse scanning needs simply. No adapters or add-on kits. Everything is built-in, and is available with the push of a button. ScanGear Toolbox CS lets you select the final destination of your scan such as printer, e-mail program, fax, copy or others.¹ Or, direct driver control lets you adjust scan size, resolution, and other parameters. The USB interface connects to either Windows 98/Me/2000 or Mac OS systems.²



**600 x 1200 dpi,
24-bit colour input.**

Photo print and text scanning resolution goes up to 600 x 1200 optical dpi with 42-bit colour input capable of capturing more than 4 trillion colours. Data can even be software enhanced to 9600 dpi.³



...scan trannies with a built-in film adaptor, for just \$299.

Superior 35 mm film scanning with VAROS.™

The scanner cover includes a built-in back light for film that reaches an extra large CCD sensor. Much like high-speed film, it has a relative light sensitivity up to 4 times greater than many 1200 dpi CCDs. It uses Canon's innovative two-pass VAROS scanning technology where the second pass is refracted by half a pixel. It activates automatically at resolutions greater than 600 dpi, capturing data that could be lost on a lesser scanner. The result is 1200 x 1200 optical dpi film scanning in less space and at lower cost.



Edit and store photos easily.

ArcSoft PhotoStudio 2000 provides tools for editing photos, and ArcSoft PhotoBase creates an electronic photo database. Also included are Caere OmniPage Pro for Optical Character Recognition,⁴ plus Adobe Acrobat Reader and PDF manuals for Windows and Mac.

Canon Customer Care. The one-year warranty is upgradeable to three years for a minimal charge, and is backed by Customer Care hot-line support. For more information call 1800 021 167.



**CanoScan™
D 660U**
Just \$299^{RRP}



You can...

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THE RIGHT SETTING

Hopping from one Net connection to the next can make a mess of your OS. Switching from the wireless network at the airport to the ISDN line in the hotel to the dialup account at your friend's house can wreak havoc on system settings. It's easier to manage multiple Net connections using Windows XP and it will certainly get you on to the wireless network in a Qantas lounge more easily than an older system. On the other hand, Mac travellers will quickly find themselves in hostile PC territory. iBook users running OS 10.1 have step-by-step Internet access for standard data ports, yet wireless and broadband networks are likely to be off-limits. Don't count on finding Mac-savvy tech support either.

ISP, access to a dedicated 24-hour support desk is a traveller's treasure chest for finding a local IT all-rounder who knows how to tweak your modem dialling string.

"At the end of the day, people just want to connect," he says. You won't find broadband or wireless Net access in his hotel. "Many guests prefer to use tried and tested ways because standards are entrenched — contrary to what vendors are saying." However, that's changing quickly with the increasing sophistication of the notebooks walking through his lobby.

There's a smorgasbord of Net access options throughout the

THE WORST FEATURE OF A SLIMLINE IS THE COST. CHOOSING A STRIPPED-DOWN OR LESS EXPENSIVE MODEL MAY LESSEN THE PARANOIA ASSOCIATED WITH CARRYING A PRECIOUS ITEM INTO UNKNOWN TERRITORY.

conference centre and rooms in the Westin Hotel down the road. Settle into your room and select from dialup, ISDN, ADSL or Ethernet through the data port beside the phone. About 45% of the hotel's (mostly corporate) guests use Internet access on any one night. IT manager Alex Aranchikov has 15 around-the-clock support staff on hand to tweak incompatible international hardware and figure out why your modem won't work on the local phone lines.

If you bought a wireless PCMCIA card for the airport, at this stage it's hard to find wireless networks on the road. In the real world, wireless networks can be difficult (and expensive) to install in some hotels. Airport lounges are small and plain, but hotel foyers are often packed with flashy reflective surfaces, along with elevator shafts and other metal structures that create havoc with the network signal.

It's a recipe for an unstable network. A poorly planned layout will suddenly cut you off or create some serious data-corruption in the middle of downloading an important document. Cables are simply more reliable.

At the Park Hyatt down by the Harbour Bridge, you can order the ultimate Net room service — a five-way cabled room with the works. Of course, it will cost the earth, but "it'll allow you to do pretty much anything," says IT manager Greg Daniels. Only top CEOs have asked for the luxury service, but it's fun to dream . . .

STORAGE

While all the important data is always stored on a server or desktop back home, for emergency backup and swapping files, picking the right storage gadget to travel with can be agony.

There are just so many cheap and light storage devices out there — we're spoiled. A simple plug-in USB device like the 8MB IBM Memory Key is fast and easy for light travellers, or there's USB or FireWire external disk drives if you want 100GB of space. A MicroDrive is a compact compromise between the two.

For removable storage, use the CD-RW drive on the iBook to copy files to a CD. An iBook running OS X 10.1 will move files to a CD as easily as copying to a floppy that can be posted home (the family will be thrilled to get discs filled with photo galleries), or stashed in a suitcase. The Sony Vaio 505CT actually has a floppy drive as part of its docking station. While it's an annoying slab to lug everywhere, the extra features *do* provide more options than the ultra-ultra-portable Sharp PC-UM10. The Sony slimlines also have MemoryStick technology for saving and swapping files.

STREETWISE

APC's jet-setting technical writer had just finished an article about his travels with technology when his notebook was stolen. He woke up in his seat during a long-haul trip in North America to find his notebook and all his work gone forever.

The worst feature of a slimline is the cost. Choosing a stripped-down or less expensive model may lessen the paranoia associated with carrying a precious item into unknown territory. Of course, he could have looped a few lengths of cut-resistant galvanised steel like the Targus DEFCON CL Cable Lock or the Kensington Security

SOFTWARE ON THE GO

Handy Backup 2.0: Automatically save files to a remote server or another disk.

pcAnywhere 10.0: Access your desktop on the road and manage files and applications like you never left home.

SafeHouse 2.0: Protect your hard drive with powerful encryption.

Lock My PC 1.3: Disable your notebook whenever you're not using it.

Magic Folders: Make confidential folders invisible to prying eyes.

Protect your system from baddies with a firewall. Try ZoneAlarm 2.6 (APC November 2001) and Tiny Personal Firewall 2.0.12 (APC July 2001).

I can...



High-speed Galileo Lens, 1200 x 2400 dpi.
The easy-to-use unit delivers studio quality 1200 x 2400 dpi optical resolution for almost the same price as many 600 dpi scanners. The five-element, aspherical lens system eliminates distortion. A shortened optical path and wide aperture lens (f-stop=5.5) increase scanning speed and improve signal to noise for a more optically accurate system. A true 1200 dpi CCD sensor is capable of finer detail and more accurate colour.



Spherical aberration —
Light converges at different points.

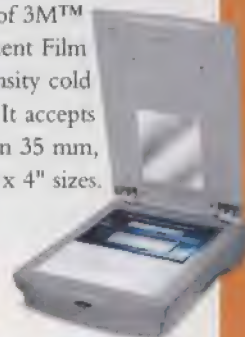


Galileo Lens — Light converges
at a single point.

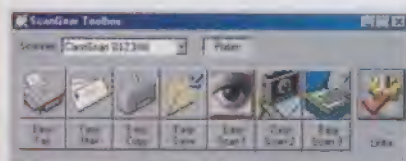
...scan film and prints up to 1200 x 2400 dpi with 48-bit colour.

High intensity film adaptor.

The optional film-scanning unit replaces the standard cover for reflective and film scanning, and matches or exceeds the performance of expensive moving light source designs. The light source in the cover uses dual sheets of 3M™ Brightness Enhancement Film plus dual, high-intensity cold cathode fluorescent lamps. It accepts colour negatives and positives in 35 mm, 2 1/4" and 5" x 4" sizes.



Optional
FAU-S12 film adaptor, \$199.^{***}



ScanGear
Toolbox CS offers
"point and click"
simplicity.

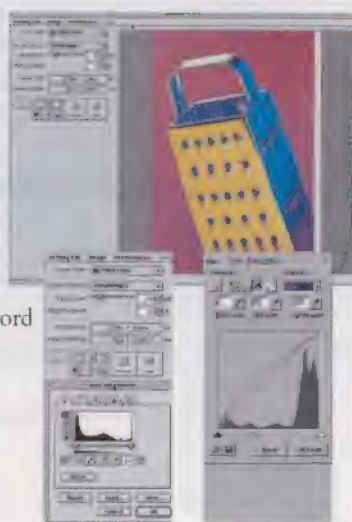
USB and complete software suite.

The USB interface connects to Windows 98/Me/2000 and Mac OS systems.[†] ScanGear control software, a universal Twain/Plug-in Driver, PhotoShop 5.0LE and ArcSoft PhotoBase are included for both platforms. ScanSoft OmniPage Pro 9.0 for Windows and OmniPage SE for Macintosh are also included for OCR. Canon PhotoRecord (Windows)/ ImageBrowser (Macintosh) helps users to easily copy, enlarge and print photos.



48-bit colour input.

True 48-bit input and 42-bit output increases subtle tonal variation and colour accuracy.

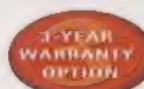


Advanced manual controls.

CanoScan™ D1230U Just \$449^{***}

Canon Customer Care. The one-year warranty is upgradeable to three years for a minimal charge, and is backed by Customer Care hot-line support.

For more information call 1800 021 167.



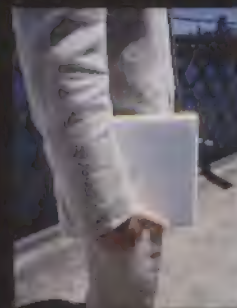
You can...

Canon

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**A SLICE OF WHITE:
APPLE'S IBOOK
BALANCES PRICE,
POWER AND STYLE.**



Notebook ComboSaver around his chair and through the lock slot on his notebook. Or perhaps the Targus Defcon 1, a cable lock with a 110 decibel alarm and motion detector.

These notebook equivalents of bike locks and car alarms are unwieldy, heavy and impractical for tired travellers. Besides, how many times have you responded to a car alarm?

The best defence against theft is disguise. The worst notebook accessory in the world is a notebook bag. The Dell Latitude C400 comes with a typical black laptop shoulder bag (complete with a carefully sewn "Dell" insignia) which screams "I'm carrying something with a street value of \$5,000."

Why would you get your fashion accessories from a PC maker? Because it's hard to stuff a notebook (even a slimline) into a normal bag, and it gets scratched and tumbled anyway. A bag with a special padded notebook compartment should automatically be the second investment after a slimline. More stylish and comfy bags are appearing in luggage shops; the only hard part is choosing which colour and design will suit. On-site project work needs a hands-free backpack, but the satchel bag still rules corporate situations. Choose your favourite colour and style from the huge STM range, or between Kensington's (less stylish) bags.

I can...



ScanGear is also a universal TWAIN Plug-in driver that offers direct control for pre-scan settings or enhanced resolution up to 9600 dpi³ for applications such as the bundled Adobe Photoshop LE.

...scan up to

1200 x 2400 dpi with 48-bit colour for just \$329.

Semi-professional 1200 x 2400 dpi.

Canon's patented LIDE™ Technology is a flatbed scanning breakthrough that changes the scanner price/performance ratio. The 48-bit



colour input, demonstrates the evolution of this technology, delivering superior tonal gradations in a super slim design.



"Z-lid", advanced OCR.

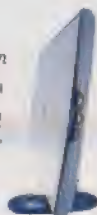
This special lid simplifies book scanning and bundled Caere OmniPage Pro¹ OCR converts scanned text into editable data.

Plug 'n play USB for Windows and Mac.

The USB interface lets you plug in or disconnect your scanner at any time and, because it is powered through the USB cable,² the scanner does not require an AC cable.



As an added advantage, you can stand up the unit to make room on your desk, and still use it to scan at any time. The CanoScan N1240U sets a new standard in quality, style, and ease of use.



Simple, professional quality software.

The one-touch scan buttons activate ScanGear Toolbox CS to select the destination of your scan such as colour print out (copy), e-mail program, fax or others.⁴ Edit and store photos easily with ArcSoft PhotoBase, which creates electronic photo albums, and ArcSoft PhotoStudio, which allows for easy image editing.



Canon Customer Care. The one-year warranty is upgradeable to three years for a minimal charge, and is backed by Customer Care hot-line support. For more information call 1800 021 167.

CanoScan™
N 1240U
Just \$329^{RRP}

You can...

Canon

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CS0668



MIX AND MATCH
YOUR DIGITAL
TRACKS AND
TRAVEL TO A
DIFFERENT TUNE.



HOME SWEET HOME

It's 9.30pm in Los Angeles and 12.30pm at the customs check-in the Sydney international airport. "I'm sorry," says the Australian Quarantine and Inspection Service Officer. "Would you mind placing your bag on the ground?"

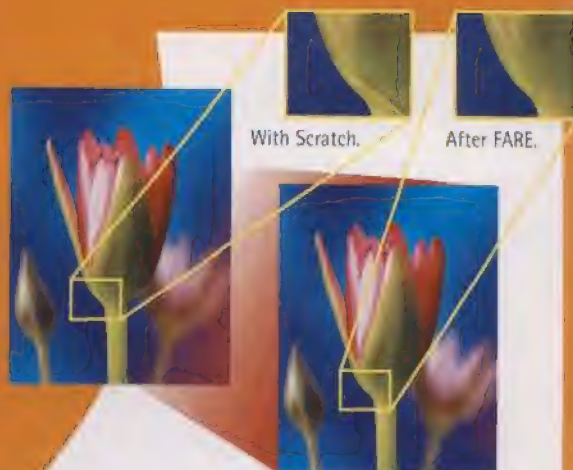
A detector beagle snuffles along the row of black satchel cases to the front of the queue. He pauses at the small silver bag with the red stripe and pokes his nose near the shiny edge of an iBook. The gate opens and the lightweight bag swings up and moves quickly through while those left behind shove their bags along with their tired feet.

The slimline is ready for the mainstream. There's still a long way to go before they're as easy to use as the phone, though, and we can only plead with PC makers, telecommunications companies and airlines to settle on global standards for hardware and Net access at this stage.

A slimline will help make any trip more fun and productive — and not to mention a lot less lonely. Whether you use a public wireless network or a normal phone line, staying wired with a portable on the road is the only way to travel. Don't leave home without one.

Photography Hamish Ta-mé **Location** BLACKETHOTEL tel (02) 9279 3030 **Styling** Vanezza Cheng **Hair and make-up** Kateri **Models** Maria and Naomi at CHIC

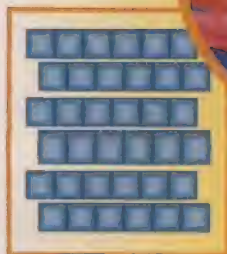
I can...



Automated image improvement.
Another Canon technology makes the scanning process more accurate. FARE detects and removes the effects of dust and scratches on film.

Ultra high performance colour scanning for the desktop.

The new CanoScan D2400UF delivers quality approaching that of scanners costing nearly ten times the price, which means professional quality scanning is now within the reach of the small professional studio.



The six-element, wide aperture lens system eliminates distortion, increases scanning speed and improves signal to noise while delivering 2400 x 4800 optical dpi and 48-bit colour input/output. At the same time, the six-line hyper CCD also delivers an Optical Density of 3.3, a standard by which desktop drum scanners are judged.

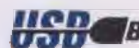
...get virtually drum scanner quality, for an unbelievable price.

High intensity film adaptor, built-in.

The scanning cover is used for both reflective prints and film. It matches or exceeds the performance of expensive moving light source designs, and accepts colour negatives and positives in 35 mm, 2 1/4" and 5" x 4" sizes.



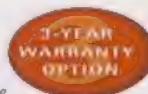
Built-in film adaptor.



USB and complete software suite.

A USB interface for Windows 98/Me/2000 and Mac OS systems,¹ Twain/Plug-in Driver, PhotoShop 5.0LE, ArcSoft PhotoBase, OCR software and photo management software for both platforms are also included.

Canon Customer Care. The one-year warranty is upgradeable to three years for a minimal charge, and is backed by Customer Care hot-line support. For more information call 1800 021 167.



CanoScan™
D 2400UF
Just \$899^{ms}

You can...

Canon

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APPLE IBOOK

The iBook is a true original. No PC maker can match it for style, price and quality. The slimline iBook is Apple's second crack at the market since the first colourful models caused a stir in 1999. It has grown (so to speak) into a versatile machine that suits everyone.

Six months after the ice-white iBook was launched, it became the best-selling Mac notebook of all time. At the same time, Apple improved chip speed and storage. There are four configurations, starting from the 500MHz base model, to the top 600MHz model, which has a CD-RW and DVD combo drive. Each iBook still only comes with a measly 128MB of RAM, though (expandable to 640MB).

It's still nice for the price: the base model goes for \$2,995 and the top model \$3,895. Standard features include two USB ports and one FireWire port, a 56kb/s modem, Ethernet and video ports, and an inbuilt AirPort antennae for wireless networking (the AirPort card is an option). Graphics are reasonable, due to the 256Kb/s on-chip cache and the ATI RAGE Mobility 128 graphics accelerator

with 8MB of SDRAM.

You'll never have to treat this portable with kid gloves. The outer casing is a tough clear plastic with a smooth rubbery feel. It's almost the same size a sheet of A4 paper, and at 2.2kg and 3.4cm thick, it's easy to cart around. The 12.1in TFT XGA active matrix display keeps the package compact, and the battery holds out for four hours of reasonable use.

The only roadblock is, of course, compatibility with PCs. The iBook is easy to plug straight into the Internet, but networking with PCs is a nightmare. Mac OS X 10.1 does have more support for peripherals and with more formats now based on universal Net standards, swapping files isn't as painful as it used to be. It's a personal choice, and one that's becoming much tougher to make.

Price \$2,995

Online www.apple.com.au

Rating ■■■■



DELL LATITUDE C400

The Dell Latitude certainly isn't the most exciting portable notebook out of the selection we've reviewed here, but it's a good, solid, dependable one. Like the other ultraportables in this roundup, features a 12in LCD display capable of 1,024 x 768 resolution in 24-bit colour, built-in 16-bit sound (with external connectors, which is just as well, because the internal speaker is horrible), 56Kb/s modem and 10/100 Ethernet. It is the fastest of the crop we reviewed here, with a speedy 866MHz mobile Pentium III. Not surprisingly, a fan and ventilation holes are clearly visible underneath the unit. The Latitude is also the only machine that we reviewed that comes with both trackpoint and touchpad mouse control, which is a welcome feature since notebook users generally tend to prefer one or the other.

The Latitude is also unique among the group in that it doesn't sport a sexy design or any high-powered features, apart from the CPU speed. It comes with only a 10GB drive (although options exist to install 20GB or 30GB drives)

and a single USB port, and it doesn't have any special software or any nifty options such as a built-in wireless or a microphone.

As for longevity, the battery life is only two and a half hours. On the other hand, the Latitude C400 is priced accordingly.

The unit we reviewed did come with a carry bag (the only machine to do so). As we mentioned, this protects the machine but it also advertises the fact that you're carrying a valuable piece of equipment around. The Dell also comes with an external CD-ROM and floppy drive, and Windows 2000 preinstalled. All up, the Latitude C400 isn't a standout machine, but its simple design and economical price make it a good choice for a basic workhorse notebook.

Price \$5,000 (approx)

Online www.dell.com.au

Rating ■■■



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As with all Thinkpads, the most noticeable feature of the X21 is the trademark black rubber encasing that just oozes style and durability. Boasting a titanium composite chassis and no plastic breakable bits, it certainly looks like it can take a beating.

As with the other notebooks in this review, 128MB comes standard, along with a 20GB hard drive and 16-bit sound. While the X21 comes in a variety of processor speed configurations, the machine we reviewed used a 700MHz mobile Pentium III — plenty of grunt for the road. Other standard features include built-in 56KB modem, 10/100 LAN, Rage Mobility graphics, monitor out and two USB ports. External drives provide removable media.

IBM has included a good system software set, containing a comprehensive configuration program and a battery maximiser wizard to help tailor power savings to different tasks. This is in addition to Intel's SpeedStep technology, which tames the CPU when the system is running from batteries.

One of the most innovative features of the X21

is its night-light, a small but very bright lamp which can be turned on and off from the keyboard. It provides enough light to see the keyboard in low light and dark conditions (while chewing up more power, of course).

In terms of power, there's enough juice to keep you on the road for three and a half hours, according to BatteryMark 4.01. As there is no removable media bay for a second battery, however, this is the most you'll be able to get from the X21.

The ThinkPad is by far the most rugged of the group, and with its all-black design inside and out is likely to win the hearts of trendier mobile professionals.



Price \$3,699

Online www.ibm.com.au

Rating ■■■■■

The PC-UM10 immediately stands out from the crowd for one very obvious reason: it is only slightly thicker than a slice of bread. If you've been looking for the ultra-ultraportable, this has to be it.

Given its size, you might expect it to be underpowered, but apart from making use of a mobile Pentium III 600MHz processor, it matches the specifications of every other machine in this review — 20GB hard drive, 128MB of RAM, 12.1in TFT display and, to our surprise, a rather good battery life of 1 hour and 42 minutes.

The lid is understandably rather thin — still strong enough to wear normal travelling accidents, but it's not indestructible. If you wanted to, you could bend and break the screen quite easily. Our review machine actually came with a dead pixel on the TFT display, but we presume the final retail machines will be more thoroughly tested.

The keyboard is another fine feature of this machine — it has a greater depth than the other notebooks, and a satisfying click when keys are pressed, which combines to make this by far the nicest of all the notebooks to work with. It

also retracts into the machine when the screen is closed.

The unit even passes the breakable bits test — it doesn't have any. The modem and network ports are covered by a removable rubber flap, and the only other removable piece on this machine is the battery. There is nothing to unscrew and replace in this machine; it's a completely sealed package.

The usual peripheral features are incorporated, including 56KB modem, 10/100 LAN, 16-bit sound, Rage Mobility graphics, a single PCMCIA port, a USB port, and a connector that allows an external floppy and CD-ROM to be attached.

The PC-UM10 is a sleek, super-thin, cleanly designed machine that will be the envy of mobile aficionados everywhere.



Price \$5,295

Online www.sharp.net.au

Rating ■■■■■

SONY VAIO C1VG

The C1VG can easily be thought of as a cut-down version of the 505CT without built-in networking and with a Webcam thrown in. It's as easy to carry in one hand as a book, and about the same weight. Its small size is reflected in a battery life of only two and a half hours — not long enough to keep you entertained on an international flight, but enough for a trip away from the office.

It only supports a maximum resolution of 1,024 x 480 on its TFT display, but can power an external monitor to 1,600 x 1,200. When you're used to the near-perfect square of normal monitors, the "wide-screen" display initially isn't that appealing, but you get used to it.

The "Motion Eye" digital camera is adequate for simple tasks, capable of taking 640 x 480 24-bit colour images. It can also take video, but only at a super-low 160 x 120 resolution at a maximum of 10 frames per second.

Portability is certainly a strong point of the C1VG, but does it have grunt? The C1VG

is the only machine in this group that makes use of a 600MHz Transmeta Crusoe processor, a CPU specially designed for the mobile market that features low power consumption and heat dissipation. Transmeta prides itself on the Crusoe being a dual hardware/software solution, so the C1VG comes with Transmeta's LongRun power management software, which is capable of dynamically adjusting the CPU's clock speed, and thus power usage, according to system load (this is a little more advanced than Intel's SpeedStep technology).

The C1VG sports 128MB of RAM, a 14GB drive, 16-bit sound, Windows Me and, scoring cool factor points, Sony's Memory Stick technology. If you have other Sony peripherals, the Vaio C1VG will certainly fit in well.



Price \$3,799

Online www.sony.com.au

Rating ■■■■

SONY VAIO 505CT

The Vaio 505CT is the second fastest machine in our group, utilising a mobile Pentium III 850MHz chip, complemented by the standard 128MB of RAM and 20GB hard drive that is common for the ultraportable range.

It is, however, the only notebook in our selection that comes with a docking station sporting a floppy, 8x/24x/12x DVD/CD/CD-R drive, and the full monty of peripheral connections, including parallel port, serial port, monitor out, a 10/100 port and two USB ports (in addition to the two USB ports on the notebook itself). The docking station is thin and light enough to travel with you, but isn't required unless you need removable media access, as the 505CT includes the aforementioned two USB ports, a 56KB/s modem, 10/100 LAN and monitor out. And it also includes Sony's Memory Stick technology.

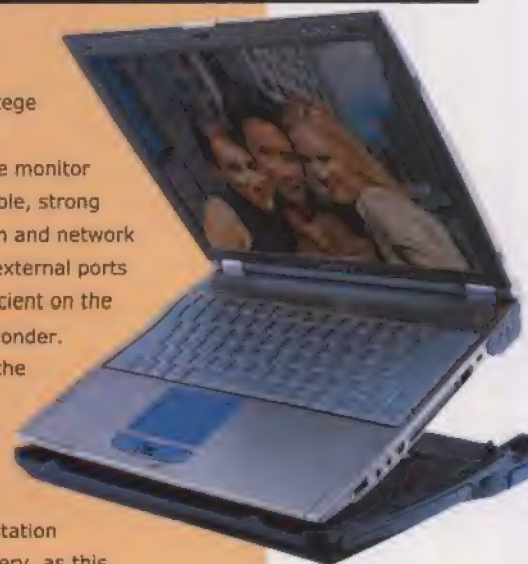
Of note is the addition of a "jog dial" in the middle mouse button, which activates certain features in Sony's supplied software (including digital music and video/camera picture editing),

as well as doubling as a scrolling mouse wheel.

Competing with the Portege 4000, the 505CT features a breakable plastic flap on the monitor out, but a much nicer, flexible, strong rubber cover for the modem and network ports — now why don't all external ports use this? It'd be just as efficient on the monitor port. We have to wonder.

According to our tests, the battery life is two hours and 12 minutes, which is very respectable. It's a pity that neither the notebook nor the docking station has space for an extra battery, as this would allow it to compete with the Toshiba for extended use on the road.

With its multimedia software and memory stick technology, Sony is aiming the Vaio 505CT squarely at the digital device interoperability market, making this a good choice for the mobile, connected professional.



Price \$5,499

Online www.sony.com.au

Rating ■■■■

NOTEBOOK SPECIFICATIONS AND RESULTS

Product	iBook	Latitude C400	Thinkpad X21	PC-UM10	Vaio 505CT	Vaio C1VG	Portege 4000
Contact	Apple	Dell	IBM	Sharp	Sony	Sony	Toshiba
Phone number	13 26 22	1800 812 393	1800 289 426	(02) 9830 4600	1300 137 669	1300 137 669	1800 021 100
Online	www.apple.com.au	www.dell.com.au	www.ibm.com.au	www.sharp.net.au	www.sony.com.au	www.sony.com.au	www.toshiba.com.au
Price	\$2,995	\$5,280	\$3,699	\$5,295	\$5,499	\$3,799	\$5,087
Warranty	1 year RTB	3 year RTB	1 year on site	1 year parts and labour	1 year RTB	1 year RTB	3 years parts and labour
SPECIFICATIONS							
Processor	Apple G4 500MHz	Intel Pentium III 833MHz	Intel Pentium III 700MHz	Intel Pentium III 600MHz	Intel Pentium III 5600 850MHz	Transmeta Crusoe 600MHz	Intel Pentium III 750MHz
RAM and type (maximum)	128MB SDRAM (640MB max)	256MB SDRAM (1GB max)	128MBSDRAM (384MB max)	128MB SDRAM (128MB max)	128MB SDRAM (256MB max)	128MB SDRAM (192MB max)	128MB SDRAM (512MB max)
Hard disk	15GB	10GB	20GB	20GB	20GB	15GB	20GB
Screen size	12.1in	12.1in	12.1in	12.1in	12.1in	8.9in	12.1in
Video card	ATI Rage Mobility 128	ATI Rage Mobility M GlidePad and TrackPoint	ATI Rage Mobility M TrackPoint	ATI Rage Mobility M GlidePad	Integrated Intel 815EM GlidePad	ATI Rage Mobility-M1 TrackPoint	Trident Cyberblade XP GlidePad
Pointer device	GlidePad	External DVD-ROM	Optional external	Optional external	CD-RW/DVD combo	Not available	CD-RW/DVD combo
CD/DVD-ROM drive	CD-ROM	CD/DVD-ROM	USB CD-ROM	Internal 56KB modem Internal 10/100 Ethernet	Internal 56KB modem Internal 10/100 Ethernet	Not available	Internal 56KB modem Internal 10/100 Ethernet
Connectivity	Internal 56KB modem Internal 10/100 Ethernet Internal wireless 802.11b	Internal 56KB modem Internal 10/100 Ethernet	Internal 56KB modem Internal 10/100 Ethernet	Internal 56KB modem Internal 10/100 Ethernet	Internal 56KB modem Internal 10/100 Ethernet	Internal 56KB modem Internal 10/100 Ethernet	Internal wireless 802.11b
Dimensions in cm (H by W by D)	3.4 x 28.5 x 23	3 x 29 x 23.8	2.5 x 27.9 x 22.7	1.6 x 28.2 x 23.2	2.3 x 28 x 23.9	2.7 x 24.8 x 15.2	3.8 x 27 x 24.8
Weight	2.2kg	2.3kg	1.6kg	1.32kg	2.8kg (including docking station)	980g	1.9kg
BENCHMARK RESULTS							
SYSmark 2001	Unable to benchmark	83	74	Unable to benchmark	79	Unable to benchmark	70
BatteryMark 4.0.1:	Unable to benchmark	2:39	3:43	1:42	2:12	2:30	3:47
(Maximum performance hours:minutes)							

■ The products used in these tests are shipping versions available to the public at the time of publication unless otherwise stated.

■ All specifications are submitted by the vendor and APC accepts no responsibility for any errors. ■ Winstone, WinBench and associated products are registered trademarks of the Ziff-Davis Publishing Company.

TOSHIBA PORTEGE 4000

The Portege 4000 is a sleek, stylised notebook that will appeal to the mobile user who wants good looks as well as performance.

With a 750MHz mobile Pentium III, 128MB of RAM, 20GB hard drive, 12.1in TFT screen and built-in 56Kb/s modem, 10/100 LAN, 16-bit sound and a combination DVD/CD-R/CD-RW drive, it easily matches the specifications of most desktop systems. It has two USB ports on the rear for extra connectivity, and a slot for Secure Digital cards.

Perhaps its most interesting feature is its wireless support in the form of Bluetooth and Wi-Fi, enabling wireless networking in Wi-Fi-equipped locations. The antennae for both of these are built into the lid, so there's no need for additional PCMCIA cards, and you can disconnect from a network at the touch of a button.

This machine offers four and a half hours of battery life. Replace the DVD drive with a second battery and you can extend this to nine hours. The battery clip is a little flimsy, and plastic flaps covering some of the ports are just begging to snap off. These are minor issues, however, in an otherwise well-rounded package. ■



Price \$5,280

Online www.toshiba.com.au

Rating ■■■■

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SONY



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SOUNDCARD CHALLENGE



SOUNDCARD SOUNDOFF

WHY WOULD YOU WANT A NEW SOUNDCARD? AFTER ALL, COMPUTERS HAVE BEEN COMING STANDARD WITH 16-BIT STEREO "CD-QUALITY" SOUNDCARDS

FOR YEARS, RIGHT? SURELY THERE'S NO REASON TO UPGRADE — IS THERE? WELL, IF YOU WANT TO MAKE THE MOST OF YOUR PC ENTERTAINMENT, A NEW SOUNDCARD WILL MAKE ALL THE DIFFERENCE.

By Darren Yates

For those who still tune in to AM radio to get their daily hit of music, there probably isn't much a soundcard can do to enhance your experience. If you've moved into the world of digital entertainment however, chances are you'll need a new soundcard.

Whether it's getting floor-thumping sound from your favourite 3D games, living the action of your DVD movies or rocking along with your music CDs, the latest sound cards offer a wealth of features that will add to your listening pleasure.



Features such as digital output to connect DVD digital audio to a Dolby Digital or DTS decoder. Add a set of surround sound 5.1 speakers and your DVD-equipped PC turns into a small movie theatre package.

Some new cards, including Creative's Audigy and VideoLogic's Sonic Fury, now include 5.1-channel analog audio outputs ready to connect up to home theatre speakers.

Others, like Hoontech's SoundTrack Audio DSP24 Value card, once considered expensive "semi-professional" gear, are now becoming mainstream, offering 24-bit/96kHz audio that rivals the sound quality from a DVD player.

Digitally recording from a DAT recorder or another digital source is also easy thanks to SP/DIF connections — four out of the six cards tested in this review supported either coaxial or optical connection.

Creative's new Audigy also adds FireWire ports so you can

capture digital video from a Digital8 or DV camcorder.

You don't need to spend a fortune either; the most expensive card in this roundup is priced at \$599, but if you forego some features in favour of those you want, you can find a card to suit your needs for less \$300.

What you won't find in these cards, though, is a Dolby Digital or DTS audio decoder for DVD movies. However, with DVD software such as PowerDVD, you can use a PC and soundcard together to create a surprisingly good multi-channel speaker experience.

If you have an external multi-channel decoder, the bulk of these cards will allow you to pass the digitally-encoded signal through, giving you the "real thing".

With audio quality up and prices down, it's time to ditch two-speaker stereo and step up into the world of multi-channel audio.

SOUNDCARD CHALLENGE

CREATIVE SOUND BLASTER AUDIGY PLATINUM EX

Just released, this audio package takes consumer PC audio to a new level. It features two expansion cards and an external Audigy Drive connection box to handle the bulk of connections.

The Audigy claims a 100dB (decibel) signal to noise ratio (SNR) — basically, sound quality above audio CD standards. We tested that claim with APC's Audio Precision System Two audio test set and found it to be pretty close.

With the Creative-prescribed 2V RMS (Root-mean Square) 1kHz sinewave output, the SNR was 98dB. A more typical 775mV RMS sinewave output produced 89.6dB.

The unwanted audio colouration added by the card (known as total harmonic distortion — THD) was a very low 0.005% — levels only matched by the Sonic Fury.

Its ability to reproduce a wide range of audio tones ("audio frequency response") was within 0.5dB of flat from 20Hz to 20kHz. In other words, this card almost

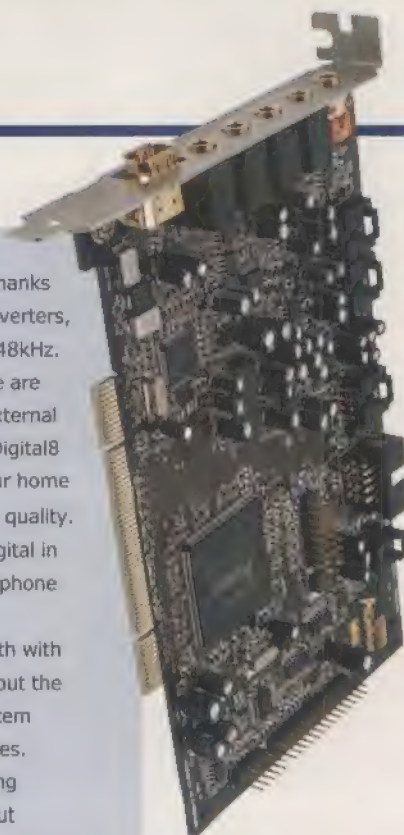
perfectly reproduces what you put into it, thanks largely to its 24-bit/96kHz digital audio converters, although its chip limits recording to 16-bit/48kHz.

FireWire ports are a new addition. There are two internal on the cards and two on the external drive box. This allows you to connect to a Digital8 or DV camcorder, so you can download your home movies digitally into your PC with no loss in quality.

The Audigy Drive is well laid out with digital in and out ports, FireWire (1394), MIDI, headphone and line inputs all located on the front.

This card has a 64-voice polyphony synth with built-in effects such as reverb and chorus, but the big news for musicians is that by using system memory you can have 1GB of sound samples.

It comes with loads of software, including drivers for Windows 98SE, Me and 2000, but you need the Microsoft 1394 Supplement update with Windows 98SE. Windows XP drivers can be downloaded from the Creative Labs Web site — www.creative.com. Although there's no DVD player software, the Audigy is a must-see before you buy anything else.



Contact Creative
Phone (02) 9666 6100
Online www.australia.creative.com
Price \$599
Rating ■■■■

TERRATEC DMX XFIRE 1024

This card by German multimedia company Terratec offers dual-channel analog input and four-channel analog output plus an optical digital output for 5.1 surround sound. However, it lacks any decoding, so you'll need an external Dolby Digital or DTS decoder before you plug in your surround speakers. Neither does it offer the 5.1-channel analog outputs you'll find in a good number of other cards in this roundup.

Terratec has a history of producing low-noise cards and this one joins that tradition. We measured the SNR at 90.7dB with a 1kHz 775mV RMS sinewave output, but the THD at 0.01% was not as good as the Audigy.

It can also handle digital recording via an onboard connector at the standard 32, 44.1 and 48kHz. In addition, there are two CD inputs plus an auxiliary input also located on the card itself.

The retaining bracket houses two stereo line-out ports, a single stereo line-in plus a microphone input — all are

3.5mm sockets. It also gives you a standard DB15 joystick port.

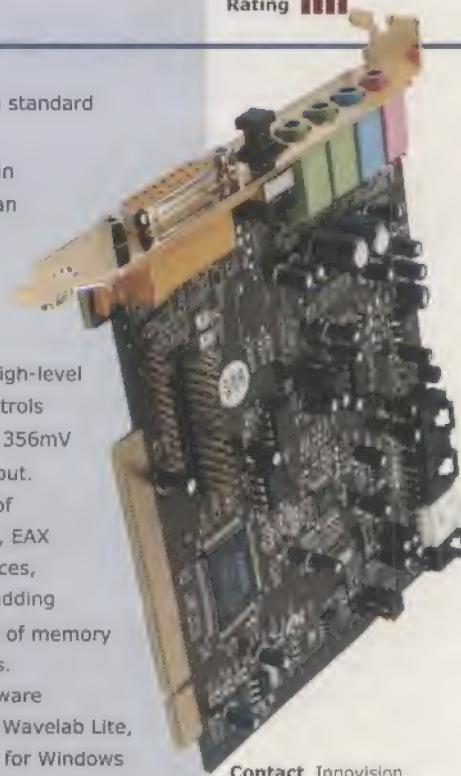
Unlike the bulk of other cards in this roundup, the Xfire 1024 has an audio mixer applet that includes a 10-band graphics equalizer to help you get your sound just the way you like it.

This card doesn't have a very high-level signal output: with all relevant controls "flat-stick", we could only obtain a 356mV RMS output from a 775mV RMS input.

The Xfire 1024 supports a raft of audio formats include DirectSound, EAX and A3D. And with up to 1,024 voices, the wavetable synth should suit budding musicians, although with only 8MB of memory support, it's not in the Audigy class.

It includes a wide range of software including MusicMatch Jukebox and Wavelab Lite, and at this stage, driver support is for Windows 95/98, Me, NT 4.0 and 2000, but no word yet on Windows XP.

Apart from the low-level output, the DMX Xfire 1024 is a good, basic entry-level choice.



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Rating ■■■

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SOUND CARD CHALLENGE

PHILIPS PSC706 ACOUSTIC EDGE

Electronics giant Philips is better known for its consumer electronics than for its PC peripherals, although its small range of USB-controlled speakers certainly made a splash. The PSC706 Acoustic Edge packs in as many features as more expensive kits, but manages to do so on just one PCI card.

Using two nine-pin DIN connectors on the retaining bracket, the card provides six-channel audio output and SP/DIF digital in/out ports. A special converter cable gives you three 3.5mm stereo connectors: front and rear stereo, and centre/subwoofer. Another cable provides digital in/out.

The PSC706 also gives you the ability to use both the centre/subwoofer and digital output at the same time.

It doesn't have built-in Dolby Digital decoding, but using the included PowerDVD 3.0 software and the card's QSound Multi-Speaker System, you get a pretty convincing compromise. You can also "pass-through" the Dolby Digital or DTS digital

signal, using the SP/DIF output, to a suitable external decoder for the real thing.

Audio specialist QSound Labs provides the main effects engine for the card, which enables it to create a pseudo multi-speaker output from any stereo input, whether it be MP3, CD or even a 3D game.

We ran the card through our test equipment and found its normalised SNR to be 89.2dB, which is quite a reasonable result; but its THD figures were not so good. At 0.018% across the board (50Hz, 1kHz and 15kHz), it's not CD audio-class.

The frequency response also starts to roll off too early and is -5dB down on (or about half) the level it should be at by the time it reaches 20kHz.

For musicians, the card's wavetable synth has support for up to 576 voices and 512-voice polyphony (that means 512 voices all at the same time, provided you have the CPU to handle it), but there is no wavetable card connector.

All up, this isn't the best card for audio quality, but as an all-round "do everything" audio solution, it's on the money.

Contact Philips
Phone 1300 363 391
Online www.philips.com.au
Price \$249
Rating ■■■■

HOONTECH SOUNDTRACK AUDIO DSP24 VALUE

Hoontech specialises in professional and semi-professional PC audio recording solutions, and it's a sign of how far things have come that this 24-bit/96kHz stereo card now comes with a consumer price tag.

If you're looking for multi-channel output and other fancy effects, this isn't the card for you. It's really aimed at the musician or audiophile who wants high-end quality, but without the hefty price tag.

The DSP24 comes with gold-plated RCA in/out sockets to handle stereo analog signals and it can handle digital in/out, but you'll need to buy the optional daughterboard for coaxial and optical digital connectors. However, the card does have onboard internal connectors for CD audio.

Installation was easy, but the software was a little more difficult, although nowhere near as bad as some semi-pro soundcards.

Hoontech claims this card has dual 100dB analog to digital converters and 110dB digital to analog converters — in plain-speak, better than CD quality — but our test results weren't as flattering.

The SNR measured 91dB — the highest we saw from any card and just down from the 95dB quoted by Hoontech — but the THD figures were disappointing. We measured the THD with a 1kHz sinewave input at nearly 0.04%, which was far worse than any other card, although at both ends of the frequency spectrum (50Hz and 15kHz) the THD reduced to more expected levels. The frequency response also rolled off at both ends of the audio spectrum, which we found really strange.

This isn't a gamer's or DVD enthusiast's card — there's no support for A3D or EAX, but there is support for DirectSound.

There's no built-in MIDI synthesizer, but the optional digital I/O board does include MIDI support. It also supports ASIO (audio streaming input/output), MME (multimedia extensions) and Gigasampler with driver software.

If you're a serious musician, you should consider giving this one a look. It does offer 24-bit/96kHz recording on a tight budget, but Creative's SB Audigy has better all-round audio quality. For home entertainment, you really need to look elsewhere.

Contact Sound & Music Promotion
Phone (03) 9528 5744
Online www.hoontech.com/english
Price \$299 card only, \$389 including digital I/O
Rating ■■■■

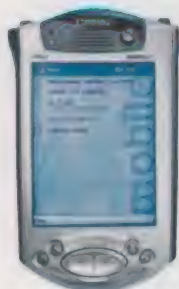
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SOUNDCARD CHALLENGE

HERCULES GAME THEATRE XP

Despite having 18-bit analog to digital and 20-bit digital to analog conversion, this card's sound quality is neither quiet nor clean. In testing, the SNR came in at 78.5dB, which is miles behind the rest of the cards reviewed. Equally disappointing, distortion levels reached 0.022% — the worst result achieved in this review. The XP may use the same CS4630 audio digital signal processor (DSP) as the Sonic Fury, but the latter provided superior results.

Using a dedicated DSP chip enables the card to do more with less. For example, you can greatly reduce the load on your PC's CPU by decoding MP3 using this chip. However, Guillemot has also provided a breakout box for almost all of its connectivity.

It's done quite a good job of this too. On the front are quarter-inch microphone and stereo headphone sockets, two USB ports and a DB15 joystick port. The serious audio ports are on the back: six RCA sockets for the 5.1-channel audio output,

another two USB ports, digital audio ports — in/out, coaxial (RCA) and optical (TOS-link) — and two 5-pin DIN MIDI sockets. Four of the RCA analog output ports double as two 3.5mm stereo sockets. The connection box connects to the soundcard with a very heavy-duty cable.

Although it doesn't have onboard Dolby Digital decoding, the XP does come with PowerDVD which, when combined with your PC's CPU, will produce a more than passable rendition. With an external Dolby Digital decoder, you can route the AC-3 signal through one of the digital output ports.

The synthesizer on this card is dual-mode, so it uses the DSP or software and your CPU to generate voices. DSP mode has a maximum of 64-voice polyphony, and in software mode it comes with an 8MB General MIDI sample set.

This is an easy-to-use audio kit but it lacks a little in audio quality.

Contact Guillemot
Phone (02) 8303 1818
Online www.guillemot.com.au
Price \$329
Rating ■■■■



VIDEOLOGIC SONIC FURY

VideoLogic is not a big name in soundcards. The company produces just one card, yet this card was the only one to rival the SB Audigy's audio quality in our tests.

The Sonic Fury doesn't allow digital input; it is a quiet card with an SNR score of 89.5dB — just a fraction noisier than the Philips and Creative cards. However, with its 0.005% THD, it matches the Audigy for sound accuracy.

This is really a Turtle Beach Santa Cruz card, and uses the same DSP as the Hercules Game Theatre XP. Unlike the XP, though, the Sonic Fury comes as a single unit, so a number of ports have to work "double-shift". For example, its "VersaJack" can be switched between coaxial digital out (for AC-3 pass-through to an external decoder), analog centre/subwoofer output to connect straight to your six-speaker system, or you can even set it up as a second stereo line-in port.

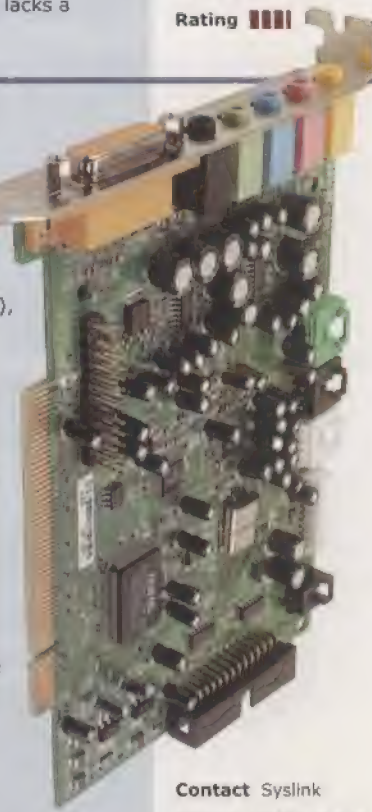
This last option allows four-channel recording, but unfortunately the Sonic Fury doesn't come with the appropriate software.

Neither is there support for optical digital out. However, the card does come with a truckload of audio applications including MusicMatch Jukebox, Making Waves Lite (128-track digital audio sequencer), Yamaha's Softsynth XG and Voyetra's AudioStation 4.

Despite having onboard six-channel analog outputs, the Sonic Fury doesn't come with DVD software. Fortunately, it shouldn't have any problems working with PowerDVD or WinDVD 2000.

For musicians, this card includes a 26-pin wavetable card header for later expansion, plus it offers the same dual-mode synthesizer as the Game Theatre XP — 64-voice hardware polyphony and up to 1,024 software voices. Although it lacks the Game Theatre XP's expansion box, VideoLogic's Sonic Fury offers more to audio purists and musicians than the XP. At the same time, it can handle Friday night DVD movies.

Contact Syslink
Phone 1800 067 722
Online www.videologic.com
Price \$245
Rating ■■■■



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SOUNDCARD CHALLENGE

HOW WE TESTED

Each card was tested using APC's Audio Precision System Two audio test unit and a standard Windows 98SE PC. Three main tests were carried out on each card: signal-to-noise ratio (SNR), total harmonic distortion (THD) and frequency response.

SNR measures the difference between the maximum signal level of a 775mV RMS sinewave input and the inherent noise generated by the card. The difference is measured as a ratio and recorded in decibels (dB). Ideally, this should be an infinite ratio but most cards rate around the 90dB (30,000 to 1) range.

THD looks at what level of unwanted audio colouration or "harmonics" the card adds to the sound on its way through. THD is measured by feeding the card with a very accurate sinewave tone of one frequency (generally 1KHz), then electronically removing that sinewave signal from the output and measuring what's left.

The result is measured as a ratio of the input signal level and recorded as a percentage. Ideally, a soundcard should deliver an exact copy of what it receives, so the THD should be 0%. In practice, all audio gear adds a small amount of harmonics. For example, a typical component CD player has a THD rating of around 0.002%. New-generation soundcards usually measure at around the 0.01% mark, but some drop as low as 0.005%.

Frequency response is a measure of the card's ability to reproduce frequencies or tones over the audio spectrum (20Hz to 20KHz).

Again, a card should deliver each tone at the same level as it receives it. When that happens, we say the card has a "flat frequency response". In practice, some cards have trouble at the low or high end of the spectrum. Some have trouble with both. Ideally, you want a card with as flat a frequency response as possible.

We also carried out the SNR and THD tests using what's called an A-weighted filter. This filter changes the frequency response of each card's output to more accurately reflect the way our ears recognise certain tones or frequencies. It's an internationally recognised standard for obtaining the best results possible from an audio device.

SIGNAL LEVEL

	Input signal level	Output signal level
HoonTech DSP24 Value	775mV RMS	721.6mV RMS
Terratec DMX Xfire 1024	775mV RMS	356mV RMS
VideoLogic SonicFury	775mV RMS	727mV RMS
Hercules Game Theatre XP	775mV RMS	730mV RMS
Philips PSC706	775mV RMS	580mV RMS
Creative Sound Blaster Audigy	775mV RMS	812mV RMS

TOTAL HARMONIC DISTORTION

	THD at 1KHz (A-weighted)	THD at 50Hz (A-weighted)	THD at 15KHz (A-weighted)
HoonTech DSP24 Value	0.039%	0.015%	0.009%
Terratec DMX Xfire 1024	0.010%	0.010%	0.010%
VideoLogic SonicFury	0.005%	0.006%	0.007%
Hercules Game Theatre XP	0.022%	0.020%	0.023%
Philips PSC706	0.018%	0.018%	0.018%
Creative Sound Blaster Audigy	0.005%	0.006%	0.006%
THD scores — lower value is better			

SIGNAL-TO-NOISE RATIO

	SNR (A-weighted) (dB relative to output signal level)	Normalised SNR (A-weighted) (dB relative to 775mV RMS output signal)
HoonTech DSP24 Value	90.5	91
Terratec DMX Xfire 1024	84	90.7
VideoLogic SonicFury	89	89.5
Hercules Game Theatre XP	78	78.5
Philips PSC706	86.7	89.2
Creative Sound Blaster Audigy	90	89.6
SNR scores — higher value is better		

GLOSSARY

SP/DIF: a fibre optic connection

TOS-link: a type of SP/DIF connector

Coaxial: a connection for analog signals

RCA: a type of coaxial connection

DIN: an older type of audio connection, still popular

MIDI: an audio format

AC-3: an audio format

SNR: signal to noise ratio (see 'How we tested')

THD: total harmonic distortion (see 'How we tested')

Frequency response: see 'How we tested'

DSP: digital signal processor

RMS: Root-mean Square, a function run to determine the value of a wave

Sinewave output: a particular audio pattern, a wave of sound

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APC TECHNOLOGY

IT'S BEEN A TOUGH AND EVENTFUL

year for the PC industry, but that hasn't stopped new and interesting products from being released onto the market. Each year, the APC Technology Awards recognise products that stand out as the best in their class. In all, the awards cover 12 categories, spanning hardware and software released over the past 12 months.

Product models that were re-released with only minor modifications were excluded from contention, which made for some very tough decisions in a number of categories.

Certain products that were released last year and renewed this year with beefier specs were sometimes better than new product releases. But in keeping with the spirit of any annual awards, we decided the APC Technology Awards would be about the best products launched this year, rather than the best products available in a category.

Products that qualified were evaluated according to five criteria: quality, design, performance, value and ease of use. Those products that best fulfilled these criteria made it through to the final round.

Judging was conducted by APC's own editorial staff, using an open democratic process — the candidate that received the most votes took the award. Each finalist was discussed at length to ensure that every issue was considered.

Over the next five pages, we reveal the results of our careful deliberations: the most outstanding products of the year!

AWARDS 2001

BEST PRODUCT: WINDOWS XP

Despite the less-than-enthusiastic reception Windows XP received from retailers when it was launched, we at APC think that it qualifies as the Best Product of 2001.

It may seem a rather obvious or easy choice to go with the biggest product launch of the year, but the decision to recognise Windows XP was made only after lengthy and intense deliberation among APC staff. The discussion was by turns passionate and philosophical, and in the final tally, Windows XP scored the most votes, but not without its fair share of competition. As the Best Product of 2001 Award is open to products in all categories, it was without a doubt the toughest of the lot to judge. Winners of individual categories were given preference, but other products were also considered.

Cynics may argue that Windows XP is just a second-rate imitation of Mac OS X, but although it looks and feels very similar, what impresses us most about Windows XP is something that Microsoft products are not traditionally well known for — stability. Microsoft had the difficult task of unifying the Windows 9x/Me and NT/2000 lines into a single platform. It needed to combine the backwards compatibility and multimedia support of 9x with the robustness of 2000 to produce the best of both worlds. That it has done so very successfully is testament to the skill of the development team.

Ultimately, Windows XP took out the Best Product Award because it most convincingly meets the judging criteria. It also represents a significant step forward in making PCs more accessible to those who have little interest in the technology and just want to get things done. This has been achieved largely by masking the OS's power and features behind friendly-looking, colourfully rendered menus in plain English, and smarter wizards. Will it revitalise the PC industry? Let's hope so, because no other single product has as much potential to do so.



FINALISTS: APPLE IBOOK, PIONEER DVR-A03

BEST HARDWARE: PIONEER DVR-A03

DVD recording is the natural successor to ever-popular CD burning, yet until the Pioneer DVR-A03 was released, the technology was out of reach for the average consumer. DVD-RAM has been around for a while, but its incompatibility with standard DVD drives has provided little reason to adopt the format. DVD-R, however, is compelling, as it offers backwards compatibility with DVD playback and various CD recording and reading formats. As Pioneer has demonstrated, it can even be incorporated into a single drive.

As a finalist for the Best Product Award, Pioneer's DVR-A03 was the strongest entrant in the hardware category. It narrowly beat DiskOnKey's excellent IBM 8MB Memory Key, which is used so frequently around APC's office that it has become a viable floppy replacement.

An exceptional PC audio kit for its price, Creative's brand-new Audigy soundcard also challenged Pioneer for the crown. However, Pioneer's achievement in being the first to introduce a previously prohibitively expensive technology to the masses swung the votes in its favour.



The DVR-A03 is the first affordable DVD-recordable drive we've seen, and combining CD-R into the same drive makes it just about the most useful single-spindle device around. It's available as a standalone drive for PCs, but it's also caught Apple's attention, and has been rebranded as a Superdrive for the new Power Mac G4 range. Combined with Apple's iDVD software, Pinnacle's DVD Express or Ulead's DVD MovieFactory, the Pioneer DVR-A03 makes DVD authoring accessible to the mainstream market.

If you've ever considered DVD authoring, or are looking for a higher capacity backup or distribution medium than CD, this is the answer.

FINALISTS: IBM MEMORY KEY, CREATIVE SOUND BLASTER AUDIGY

BEST SOFTWARE: WINDOWS XP

Considering that Windows XP is the first operating system released by Microsoft that genuinely deserves consumer support, the negativity and scepticism with which it was received is rather unfortunate. XP is the Windows we were all promised but never got. Perhaps the lack of consumer confidence in XP is the public's payback to Microsoft for all the bug-ridden releases of Windows it has inflicted on the world.

Whatever the case, Windows XP is unquestionably the best Windows yet. Microsoft has gone to great lengths to ensure backwards compatibility with running versions of software designed for both 9x/Me and NT/2000. Sure, it's not yet perfect, but it will satisfy most of the people most of the time in a stable manner — and that's what being a mainstream OS is all about.

Its closest competitor for the title of Best Software was Mac OS X 10.1. The judging panel loved Apple's Aqua interface, but all the fluid animated menus and transparency effects in the world can't hide the fact that application support has been slow in coming. With Microsoft Office 10 not yet released, most commonly used applications still run under Mac OS 9 classic mode, which rather takes the shine off using such a slick OS. The next 12 months should see a steady stream of software released for Mac OS X 10.1, but moving many of the popular apps to the new platform may take a little longer than most people are willing to hang around for.



FINALISTS: MACINTOSH OS X 10.1, MANDRAKE LINUX 8.1, ADOBE PHOTOSHOP 6

BEST NEW TECHNOLOGY: NVIDIA GEFORCE3 CHIPSET

2001 produced few standout technological innovations — most of the biggest and brightest stars in this category consisted of minor advances on pre-existing technologies. We were impressed by Intel's Pentium III Tualatin, which has given the PIII line a new lease on life. Also impressive is AMD's Athlon XP line. The 1800+ CPU manages to give the P4 2GHz a run for its money, despite being clocked at almost 500MHz slower, and costing less than half the price. However, it was nVidia's GeForce3 chipset that stood out from the others. Packed with great new technologies and full support for the advances of DirectX8, it takes the mainstream users one step closer to 3D photo-realism on the PC. nVidia's commitment to its chipset doesn't stop at the factory door either. Its Detonator drivers continue to increase performance across its range of cards, both old and new. It's rare to see such unwavering commitment to customers these days.



FINALISTS: AMD ATHLON XP, INTEL TUALATIN

BEST NOTEBOOK: APPLE IBOOK

The original iBook was released in late 1999, but Apple updated its design halfway through this year. Discarding the "clam shell" look of earlier models, the new and improved successor took on the persona of a miniature PowerBook G4. It's packed with all the same great features and then some. USB, FireWire, Ethernet and modem were all built in by default, making it one of the most full-featured notebooks available. In particular, it excels at multimedia creation — editing video on-the-go is no longer just a dream. Even more impressive is its thin design (comparatively tiny at 3.2cm thick) and light weight of 2.2kg. The icing on the cake, however, is the price — at around \$3,400 you'd be hard pressed to find a better value portable. Dell's Inspiron 8100 1.13GHz notebook also qualified as a top contender for this category. At \$4,999, it is \$2,000 cheaper than its nearest competitor, and packs the same great performance. But in the end, nothing could top the iBook's price and performance.



FINALISTS: DELL INSPIRON 8100, TOSHIBA TECRA 9000

BEST DESKTOP: DELL DIMENSION 8100

Although we only reviewed one model in the 8100 range — a 2GHz P4 — the overall quality and comparatively low cost of the 8100 line is something other manufacturers should aspire to. Excellent options, such as THX-certified sound systems, and a generally cool design only add to an already impressive product. Many smaller distributors can match Dell on price, but few can do it with such style. Runners-up in this category were few and far between. The Apple Power Mac G4 offers serious grunt to high-end users thanks to its dual processors, but it also has limited functionality and distribution due to its prohibitive price tag. Acer's Veriton FP2 was the nicest of the slim-design desktops we examined. However, its high-quality LCD and great graphics performance (due to its GeForce2 MX), are accompanied by a high price that defines it as a luxury rather than a necessity.



FINALISTS: APPLE POWER MAC G4 (DUAL 800MHZ), ACER VERITON FP2

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BEST DIGITAL CAMERA: CANON POWERSHOT G2



They don't get much better than the PowerShot G2. This spiffy four-megapixel unit is cheap and feature-packed. Incorporating 12 different shooting modes, numerous ISO settings (from 50 to 400) and four settings for saving files, it's the cream of the crop in its price range. Its 32MB CompactFlash card can be further expanded to 1GB thanks to support for IBM's Microdrives, and it even has the ability to capture Web-quality movies at up to 15 frames per second.

Runners-up were Sony's Cyber-shot DSC-F707 and Olympus's Camedia E-10. The Cyber-shot offers a whopping five megapixels, and also features the ability to record short low-resolution movies. It missed the top prize due to one significant shortcoming — reliance on a MemoryStick for storage — a format often criticised because it can only be used in Sony devices. The Camedia E-10 also offers excellent quality pictures, but it's \$3,800 will turn off most buyers.

FINALISTS: SONY CYBER-SHOT DSC-F707, OLYMPUS CAMEDIA E-10

BEST DISPLAY: AG NEOVO X-174

Our reviewer was so impressed with this beautiful LCD he claimed it "stood out like a Porsche 911 at a Morris Minor convention". Everyone else agreed. The quality of this screen is hard to match. The display offers vivid colour reproduction and great clarity, and looks, well, just damned hot. Sleek black aluminium casing surrounds the screen, which is further protected by a multilayered glass filter. Aside from shielding the LCD from damage, this filter also magnifies the onscreen display. Its multitude of input ports means you can plug just about any device into it, from your hot new graphics card to a DVD player. If this weren't enough, its optional TV-tuner (priced at \$245) doubles as a stylish photo-frame, allowing you to disguise it with a photograph. Sony's 18in SDMN80 LCD also made a good impression, although it is probably a tad expensive for all but the most die-hard fans. Philips' 17in 107T also performed admirably as a well-priced flatscreen CRT.



FINALISTS: SONY SDMN80, PHILIPS 107T

BEST HANDHELD: PALM M505

This was a highly contested category, with strong contenders across the field. Handspring's Visor Edge came close to winning, but lost out because of its non-upgradable OS. Prior to the introduction of the m500 series, the Palm range of handhelds had always been popular, but far from perfect. The m505 added a great 65,000-tone colour screen (a huge step up from the 256 colours of previous models), and a much-needed expansion slot. This freed users from the restrictive 8MB of RAM by allowing them to plug in both SD (secure digital) and MMC (MultiMediaCard) RAM wafers. Applications and data can now be loaded straight from an expansion card, which are relatively inexpensive and safe. More recently, Palm introduced the m125. Its mono display can't compete with bigger Palms, but its substantial software bundle and compact size greatly impressed our judges.

Unfortunately, Hewlett-Packard's hot new Jornada was released after our selection deadline, but it'll be considered in next year's awards.



FINALISTS: HANDSPRING VISOR, PALM M125

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BEST PRINTER: EPSON STYLUS PHOTO 895

Epson's 895 photo-printer blew us away with the quality of its images. These were indistinguishable from the genuine article; for just \$800, the 895 manages to churn out full glossy, shining prints. Printing an A4-size photo only takes about nine minutes with this baby — a significant advance on other photo-printers APC has looked at. Its only weakness is the ongoing cost: printing your own photos turns out to be almost as expensive as getting them professionally developed. But as far as affordable photo-printers go, they don't come much better than this.

Canon's S800 colour bubblejet also scored top marks for its amazing high-resolution prints (2,400 x 1,200dpi) and comparatively low \$600 price tag.

FINALIST: CANON S800,
HP LASERJET 1200



BEST SCANNER: HP SCANJET 5470C

Despite not being super high-end, Hewlett-Packard's ScanJet had enough features to steal the prize. The runner-up, Canon's CanoScan 2400UF, offered higher resolution scanning and more options, but was also a full \$300 (about 50%) more expensive. The HP has a film-scanning attachment that allows you to scan standard 35mm rolls, but doesn't have the option of scanning larger types. Still, the scan quality is excellent; unlike on the Canon, transparencies maintain their bright colours. Standard scanning is also excellent; it is of such high quality that scans can be used in professional print publications (which is saying a lot). All of this is further bolstered by first-rate software support, with easy-to-use scanning tools for both novices and advanced users. At only \$599, it blew our socks off.

FINALIST: CANON CANOSCAN 2400UF



SPECIAL ACHIEVEMENT: AMD ATHLON XP 1800+

AMD's excellent reputation in the enthusiast community is well deserved — its CPUs offer great performance at an extremely competitive price. Although the company has had some difficulty cracking the mainstream market (see On Test, page 26), it hopes to change that with its new Athlon XP line of chips. APC found the new naming convention slightly misleading, but there's no doubt that the CPUs themselves come up with the goods. In our recent testing, the Athlon XP 1800+ (clocked at 1.53GHz) managed to match Intel's Pentium 4 2GHz across a number of benchmarks, even surpassing it in places. At \$600, the Athlon XP is also less than half the price.

We're not willing to place bets on whether AMD can gain a good footing in the consumer market, but based on CPU design alone, you think it'd be a shoe-in.



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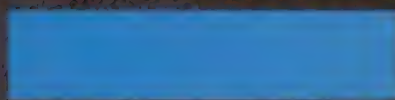
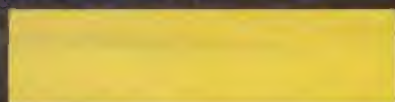
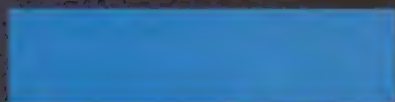




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PLUG AND PLAY GETS

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SERVERS CAN BE A SNAP

Baptist Community Services (BCS) is an aged and community care organisation with a large network spanning 25 sites across NSW. The company runs a Windows NT and 2000-based network, with around 400 users and PCs throughout its branch offices, which don't typically have dedicated network administrators. Network manager Grant Davies found the cost of managing the remote sites prohibitive: "The NT servers' labour costs (at the branch offices) were becoming unaffordable. A minor service pack update had already cost us far too much in both labour and frustration. I knew that (if BCS were to continue using NT servers) I'd have to upgrade those machines to Windows 2000, which costs us more hardware, software and labour. I couldn't justify buying a new server to replace our existing ones. I could justify buying the Snap." Davies decided to replace the existing NT file servers with Snap storage appliances.

Server trouble can make your business computing tasks more frustrating than they need to be. Servers are the glue that holds your network together, and they're very expensive, requiring fast hardware, server operating systems, client access licences, and well-trained IT administrators who often command a high salary. In addition to all this expense, servers can fail — in fact, they fail a lot. When the server is down, the problem is often treated like a minor hiccup, but its effect on a business can be devastating. During downtime, wages are paid to staff who can't do their work, productivity slows, deadlines are missed, customers get angry, and your business reputation is harmed. Isn't it time servers delivered what you paid for? Isn't it time your server simply worked?

A server appliance is designed to solve these problems. Server appliances give you a combination of hardware, software and services that are dedicated to performing a specific set of tasks with minimum fuss, such as file storage, network security filtering, Web serving, or any of the things a normal server does in your network. But because appliances are designed for a particular set of functions, they're a lot more reliable, have fewer things to configure and fewer things to go wrong. Server appliances come in a range of shapes and sizes and they don't need a keyboard, mouse or monitor plugged into them. All you need to do is plug a network and power cable into the machines and turn them on.

Server appliances are configured over the network. This generally means simple Web-based interfaces that run from another PC on the same network (initial Net configuration is generally handled by DHCP, or set from a printer-style LCD and



The systems were configured at headquarters, where Davies cloned the configuration of each new device from another Snap system already configured to meet the needs of BCS: "We can cookie-cut the servers so they all come out the same way." The appliances were deployed at each branch office, and backups were performed by a Windows application that copies all the updated files over ISDN to BCS headquarters each night.

Six months later all the branch offices are running Snap file servers, and Davies is pleased with his decision: "The devices are small and can be easily locked away, they're less expensive to buy and run and are much more reliable, but the most important thing is that they allow us to deliver better service to our users."

The move hasn't been completely without hassles: a compatibility problem with some Windows 2000 clients connecting to shares

on the Snap server required Davies and Snap distributor LAN 1 support to track down a bug, and neither party is keen to relive the experience: "Snap needs to beef up its documentation. That's been the only real problem I've had." But as an NT administrator, Davies found getting to grips with the Snap Server's different way of doing things a little difficult: "One assumes all Windows APIs are available on the devices, but that isn't always the case. It's not concerning [BCS] now, but how well will Snap support Active Directory?"

If Davies had to make the decision again, would he choose a Windows-based system? "The Windows-based appliances available at the time didn't seem to be appliances at all. I wonder how easy they'd be to upgrade, and how to do that remotely. Updating the Snap can initially seem more cumbersome, but overall it's been a positive experience. I've already chosen to use the devices in the firewall."

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■ Complex user interfaces which allow unwary administrators to damage the system accidentally. Training in their use is expensive.

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■ A massive variety of server software is available for conventional servers.

Support ■ Support is limited to the inbuilt capabilities of the device.

■ Support is available from a wide variety of vendors and is capable of handling a larger amount of variation in systems.

Reliability ■ A very specific environment that's been already well tested by the appliance vendor makes appliances extremely reliable servers.

■ Each installed system is unique and much more customised than an appliance. Integrating hardware, software, and large, general-purpose OSes makes conventional servers less reliable.

Licensing ■ Server appliances generally include a combination of hardware, software and service in a single flat price. None of the devices reviewed charged for additional client access licences.

■ Many general-purpose server operating systems are initially expensive and charge significant additional licence fees for each connection between client and server. Internet connector licences may also apply.

buttons on the device itself). The machines are preloaded with all the software they need, and all you have to do is tell them a few details about your network and how you'd like to customise the system for your site via friendly Web-based setup tools. You don't need operating system knowledge, or even much computer networking knowledge, to work a server appliance, and you certainly don't need expensive full-time administrators or vendor certifications.

This makes server appliances excellent for small and medium-sized businesses which can't always afford dedicated IT staff. The easy-to-use Web-based interfaces allow inexperienced staff to feel safe configuring their systems. Unlike regular servers, a good server appliance should be almost impossible to configure so wrongly that the system is damaged — in fact, most of the models we look at in this article can easily be reset to their default settings (without losing data) by hitting a switch on the back of the unit.

Larger organisations tend to focus on manageability and the total cost of ownership, and in this area these devices also excel. They eliminate much of the unreliability of a conventional server, so they're often cheaper to own and operate than their bigger Windows, Unix/Linux, and NetWare counterparts. System deployment is greatly simplified — the hardware is compatible with the software, all software is preconfigured and integrated, and the entire system is ready to go. Many appliance servers can be configured without rebooting, so staff don't have to schedule downtime for simple configuration changes. Since administrators in larger networks can't always be where the problems are occurring, it's advantageous that IT staff can configure these devices remotely.

IS THERE ANY REASON TO CONTINUE USING CONVENTIONAL SERVERS RATHER THAN APPLIANCES?

Appliances can also save money on licensing. The operating systems used inside them (usually embedded versions of Linux, BSD, or Windows 2000 SAK) don't require the expensive client access licensing that a Windows NT or regular 2000 server does. When you buy a server box, the cost is upfront: no per seat/server CALs, no Internet connector licences, and no time wasted on licensing audits.

Also, operating systems are much less of a concern with server appliances. The devices don't require OS-specific knowledge and (on any good appliance) one should never have to access the underlying OS directly. Neither of the network administrators we spoke to needed knowledge of the specific operating system inside their devices, and all the devices here work well within Windows, Linux/Unix or Macintosh environments (some also support NetWare). Inside the devices, you most often find Linux, but customised versions of Windows 2000 and BSD are also popular. There's little practical difference: mainly, the Linux and BSD systems require fewer reboots (making configuration faster) and the Windows devices have support for Active Directory.

So what do people actually use server appliances for? APC identified three main roles:

■ **General, multipurpose servers.** These machines perform a wide variety of common network tasks, such as file storage, Web and FTP serving, directory services, DHCP, email and more.

■ **Network-attached storage systems.** These are specialised storage machines, capable of handling Windows, Unix and Macintosh file serving. They usually have large-capacity hard disks and RAID capabilities, keeping your data safe in case of disasters.

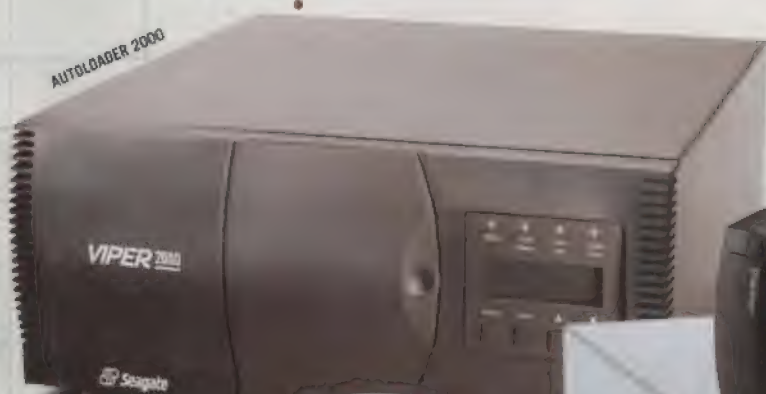
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SERVER APPLIANCES VS TRADITIONAL SERVERS CONT'D

- Security

 - OS and applications usually updated with a single file, so appliances always have the latest security updates.
 - Different components must be managed by different update systems. Security hotfixes aren't supported by all vendors. Service packs are infrequent and difficult to deploy.
- Support

 - Centralised, but limited to the server's inbuilt capabilities.
 - Spread between hardware and software vendors, but likely to support more customisation.

■ **Edge-of-network devices.** These sit on the logical "edge" of a network, providing a variety of security and access features, such as packet-filtered firewalling, sharing out an Internet connection (NAT), and storing frequently requested information from other networks (application proxies).

So, given all these benefits, is there any reason to continue using conventional servers rather than appliances? Yes — appliances aren't always the best tool for the job. It's true that fewer things to configure means fewer things to go wrong, but there is a trade-off — appliances are generally less flexible than conventional servers. Some models can have third-party applications installed on them, but none of the machines we review here are as flexible as conventional servers. While it's possible to access the OS directly beneath the Web interface, this defeats the purpose of the appliance — as soon as it is configured outside of its protective Web-based interfaces, it's just as unreliable as a regular server. In any case, very few appliance vendors support such customisation. The decision really comes down to whether you are prepared to sacrifice some flexibility for the reliability and cost benefits that a server appliance can provide — to find out more, read on!

SERVER APPLIANCES AND WHAT THEY CAN DO									
Firewalling	VPN	DHCP	File Serving (Windows, Linux, Unix, Mac)	Email	DNS	Gateway	Proxy Cache	LDAP	Web serving
Cohalt Qube 3	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mitel SME Server	✓	✓	✓	✓	✓	✓	✓	✓	✓
Maxtor MaxAttach and Iomega DataSafe	✗	✗	✓	✗	✗	✗	✗	✓	✗
Firebox III	✓	✓	✓	✗	✗	✗	✓	✗	✗
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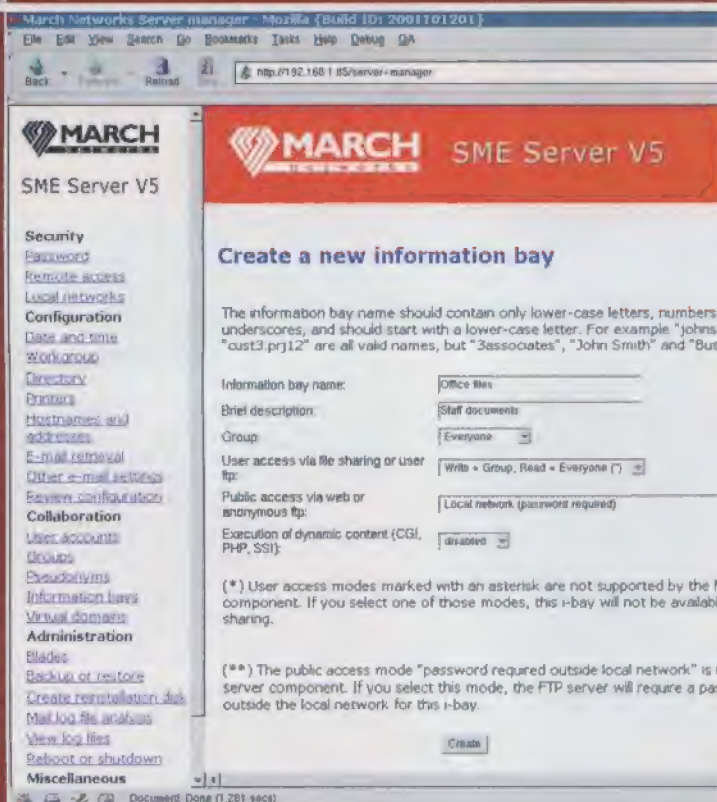
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Mitel Networks SME server



GENERAL SERVER REPLACEMENTS

THESE FULL-FEATURED APPLIANCES CAN DO
EVERYTHING A REGULAR SERVER CAN.

The Mitel Networks SME server (formerly known as Esmith and then March Networks) is a unique solution: software that turns an ordinary PC into a server appliance. The SME server can handle email (both conventional and Web-based), DHCP, ftp, Web, LDAP, file and printer serving, as well as acting as a simple firewall and gateway system. The SME server allows organisations to take advantage of the reliability and simplicity of appliance servers while saving on custom hardware. The system is incredibly simple and attractively priced for businesses which don't have technical administrators.

The software requires a 400MHz Intel or AMD-compatible PC, with 128MB of RAM and a 6GB or larger hard disk (which will have the Mitel software copied over it). An external modem is also needed if the server is to act as a dial-in gateway. Installation is a simple matter of booting from the CD-ROM, accepting the licence agreement, and then telling the installer whether you'd like RAID

support, and if you'd like to upgrade an existing system. The SME server then installs itself, no further questions asked. It's the easiest server OS to install that we've ever seen.

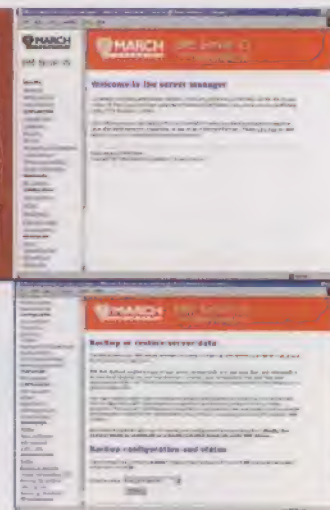
After installation finishes, the system is rebooted. A menu pops up and asks for a password, and then a wizard configures the system for first-time use, attaching the Mitel device to the network. The defaults are almost always correct if the SME server is going to be the main server and gateway on the network, and the explanations provided with the system are informative enough to allow non-technical people to change these values with confidence. When this is finished, the new settings are applied (this took around 15 seconds) and the server can then be configured through the Web-based interface.

The Web-based interface is pleasant to use, but it lacks the instant feedback that the Cobalt provides. Almost all the changes we made to the system took effect immediately, which meant that the system felt snappy and responsive. Simple tasks like adding users are made easy, as sample information is already filled out, and explanations of the various options are in plain English. The system supports direct backup to tape drives, as well as archiving to a remote system.

Creating shares is done using "information bays" which keep shared sources in sync across Windows, Mac and Linux/Unix systems. The functionality of the server can be extended with downloadable plug-ins called "blades" — we had fun trying out an MP3 jukebox server blade we downloaded (but be warned, this kind of experimentation can seriously affect productivity!).

The only flaw we identified in the system is the log files it generates, which new users are likely to find difficult to understand. This is a minor issue considering the competitive price, extensive functionality, and great performance of the system. Highly recommended.

*The SME server uses
"iBays" to share files,
which can be accessed
from Windows, Mac, Unix,
FTP and the Web.*



Price: Varies depending on support and services needed. Packages start from \$1,320 per year.

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GENERAL SERVER REPLACEMENTS

THESE FULL-FEATURED APPLIANCES CAN DO EVERYTHING A REGULAR SERVER CAN.

This 20cm-wide blue cube is capable of file serving (for Windows, Unix, and Macintosh), email serving (traditional and Web-based — think Hotmail or Yahoo), mailing lists, Web serving, FTP, proxy caching, DHCP, SQL database serving and much more. The Pro version APC reviewed includes two 20GB disks mirrored.

Connecting the Qube to our network involved plugging in the device and setting its network configuration on the buttons and LCD display on the back of the system. From there, we simply typed the Qube's IP address into our Web browser to begin customising our system. Cobalt's Web-based interface was good-looking and responsive, and would immediately pop up with a helpful message if we made a mistake (the other Web interfaces we tried would only warn us of data entry error after we clicked the Submit button).

Like all the file servers we looked at, once shares are created on the server appliance, they are visible in the Network Neighbourhood on a Windows PC or the finder on a Mac. Backups are also handled

over Windows, Mac and Unix shares. The device also features disk mirroring, which allows the system to continue providing service if a hard disk fails (APC was hoping for the chance to connect a tape device to the SCSI connector on the back of the machine, but Cobalt does not support this option). Downloading and installing updates can be handled through the GUI, and installing new updates is a simple matter of pointing the Qube at a patch file on a disk somewhere. Support for per user disk quotas and some excellent reporting functions were also noteworthy.

If the Qube is acting as a network gateway, it can work with most ADSL and cable connections and use an external modem if dialup is needed. The firewall that comes with the device is effective at filtering traffic, but it can't be customised without solid technical knowledge. The Qube also includes a Telnet server — a poor decision if non-technical users aren't aware of the security dangers of unencrypted passwords travelling across their networks. LDAP support could also be improved — Cobalt asks administrators to configure their own base Distinctive Name, even though this information could easily be gathered from other sources. More information on LDAP client configuration for desktop systems would also be useful.

The sexy blue hardware looks great, but our review model had some minor problems: the power cord would easily slip out of the unit if it was moved, and the UltraSCSI connector was, unnervingly, pushed into the device on one side.

The original Qube was massively popular when it was released. The Qube 3's wide variety of services (especially the Web-based email and Web server, with PHP and Frontpage Server Extensions) and excellent Web-based configuration system mean it is still a solid, effective replacement for most general-purpose servers.

The sleek blue cube provides a comprehensive set of functions and has the slickest Web interface of all the appliances we looked at.

Contact: Sun Microsystems Australia
Phone: 1800 628 193
Price: Cube 3 Pro \$4,510
Online: www.cobalt.com



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Watchguard Firebox



► Firebox 1000



► Firebox 700

NETWORK SECURITY

THE FIREBOX COMBINES SERIOUS SECURITY FEATURES WITH AN EASY-TO-USE DESIGN.

This bright red box is aimed at large organisations that require the easy manageability of an appliance, and that also want all the functionality larger, more security-focused networks require too.

The Firebox can be configured from a client machine over the network or locally via a direct serial connection, using the same Windows-based client software.

The Firebox system can be installed using one of two different methods: It can either be installed as a traditional firewall and gateway with stateful inspection, or it can be installed in what Watchguard calls "Drop-In mode", which uses ARP proxying to integrate the Firebox into the network transparently without any client-side reconfiguration.

This drop-in mode makes that the Firebox much more difficult to attack remotely; but is limited to smaller, non-routed networks.

Once the basic setup is in place, you can customise the firewall rules or set up a variety of additional (and quite useful) features: Web content filtering (screening out inappropriate sites using a very large database maintained by SurfControl), email spam server blacklists, security filtering (removing malicious Java and ActiveX controls) and limiting use of the system to authenticated users (using a Windows NT domain group).

The initial setup wizard can be quite technical but it's well managed, and the Firebox manual gives administrators a very clear idea of how to integrate the system into their networks. The default policy allows the internal network to access the external one, and blocks most unwanted traffic from the outside.

Administrators can then use the Security Policy Manager in order to create a more specific set of rules that can be used to deny or to allow a wider variety of network data, as well as to establish end-to-end VPN connectivity using an IPSec-based VPN.

This is a fairly technical process, but the Watchguard also produces detailed reports that contain useful information, including traffic usage by different services, hosts and users, which means that administrators can tell exactly where all the system's bandwidth is going.

The Watchguard Firebox is a powerful system that's well suited to experienced administrators who want the manageability of an appliance but don't want to sacrifice any of the flexibility of a custom-built firewall. However, those without experienced administrators on hand should perhaps look elsewhere.

1. The front panel provides a view of traffic moving between different networks and how the firewall is filtering them.

2. It also shows network traffic levels and how busy the Firebox is.



Price: Firebox 1000: \$9,460
The Firebox 700 contains the same features on slower hardware and costs \$5,990.

Contact: Firewall Systems

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NETWORK- ATTACHED STORAGE

THESE DEDICATED FILE SERVERS HAVE THE SPACE
AND RELIABILITY TO STORE YOUR COMPANY DATA.

These network-attached storage (NAS) devices are part of the first generation of file server appliances to use the Windows 2000 Server Appliance Kit, a customised version of Windows 2000 that includes a new Web-based interface as well as preconfigured support for Macintosh, Unix NFS and NetWare-compatible file storage. The hardware used in both machines is identical: a rackmount case with four 75GB IDE disks, in RAID 5 configuration. Since one disk is used for parity, there's about 160GB of space left. There are two 100MB Intel network cards, and our review models also came with an optional Intel Gigabit card.

The MaxAttach is installed fairly easily: If your network is running DHCP, it will get an IP address from the server; otherwise, you can configure it using the included MaxNeighborhood discovery software for Windows. The Web-based GUI is slick and clean, information on system status is always available at the top of the screen, and the online help is comprehensive.

However, although Windows 2000 SAK allows companies like Maxtor and Iomega to create plug-ins, many tasks, including backup and choosing an email address to send appliance alerts to, cannot be performed over the Web interface. Instead, a second login directly into the operating system through Windows Terminal Services is needed. This requires knowledge specific to Windows 2000 Server, and although many of the tasks that must be handled over Terminal Services are fairly straightforward, the second login and dialog box warning users not to modify any of the other options presented to the applications on an NAS appliance make it more awkward than necessary.

Windows 2000 SAK does, however, have the best integration with Windows-based networks. The Maxtor and Iomega are the only devices we saw which support Active Directory. It's also possible to install any Windows 2000 Server software on them. These machines would serve especially well as general (non-appliance) servers, where their inexpensive licensing options, good-quality hardware, and access to Windows features like Active Directory and Access Control List file permissions would make them excellent replacements for existing NT servers. But neither work as well as a NAS device — the patchy Web-based interface doesn't allow you to configure all features of the system, many configuration changes require reboots (which took four and a half minutes on the Maxtor, compared to 90 seconds on the SnapServer), and there's a whopping 2GB of OS software to keep updated.

Both of these systems are excellent general-purpose file servers, but lack many of the advantages of server appliances. ■

Despite their different looks, these two network-attached storage products have identical hardware.



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WEB CAREERS

PROFILE KATE GUNN



KATE GUNN'S MOTHER GAVE HER ONE OF THE best pieces of advice she's ever had — to get fluent in Mandarin Chinese. She also convinced her to get some financial experience, so Kate worked for the National Australia Bank while studying at the University of Melbourne. A year later, she switched to Hong Kong Bank, and moved into IT.

At 22 she relocated to London and gained four years' experience with mainframes, PC hardware, software, communications and operations. She also managed 30 employees on one of the largest IT help desks in Europe.

This made her aware that she liked working with people and computers. "I returned to Australia and founded Larkfield Computer Services, which provided IT consultancy and training services."

After four years, Larkfield found itself severely under-capitalised. Gunn realised she didn't know as much as she had thought.

She participated in the AusIndustry Enterprise Workshop, "an excellent training

SECURE YOUR CAREER

IF YOU TRUST YOUR EMPLOYER OR CONTRACTING COMPANY TO MANAGE YOUR FUTURE CAREER, THEN YOU'RE EFFECTIVELY OUTSOURCING THE RESPONSIBILITY FOR IT. IT'S TIME TO TAKE BACK CONTROL. *By Philippa Yelland*

When Kate Gunn realised her own IT company was severely undercapitalised, she had to examine her skills — and aims in life — to decide on the best move. Her three great passions were speaking Mandarin, people and IT, and now she says she's in the perfect job: as the Asian area manager for e-learning in the Angus Knight consulting group.

Gunn is a classic example of someone who has drown-proofed her career: she stopped thinking like an employee — even though she is one, at present — and worked out what she has to offer, where, and to which company she would prefer to make her offer (see profile).

Don't waste your time reading the latest John Grisham doorstopper this Christmas — use the holidays to do some serious reading and drown-proof your IT career too. Read *What Color Is Your Parachute?* by Richard Nelson Bolles, or Helen Harkness' *The Career Chase: Taking Creative Control in a Chaotic Age* (www.career-design.com) and at least one lateral teach-yourself software manual. If you're an OS guru, bone up on an unusual new app.

Witness the recent HP-Compaq takeover, and the continuing fallout for employees who thought they were safe with two of the biggest names in the business. Even IT employees who are deliriously happy with their SAS-like e-security jobs, waking every day to foil the latest break-in, have to start imagining how they'd feel if their boss/job description changed.

experience", and realised that working for a large employer would provide a learning environment and the opportunity to achieve something big. So she spent two years running Spherion Education in South Australia, turned losses into profits, and was a finalist in the Telstra Business Woman of the Year awards.

Back in Sydney, a one-year stint as Education Services Director for PeopleSoft Asia Pacific added more skills to her IT repertoire: enterprise resource planning and customer relationship management systems.

Now, as general manager of LearnNow — Angus Knight's e-learning arm — 36-year-old Gunn is responsible for creating and developing one of the first e-learning solutions in Australia. "All the experience I've gained in IT,

education and project management has led me to what I consider my perfect job."

For an e-learning career, Gunn recommends experience in the strategic software solutions field, formal educational qualifications, enthusiasm and an interest in people. She also recommends the AusIndustry Enterprise Workshop if you're starting your own business.

Her qualifications include bookkeeping, train-the-trainer, a Certificate IV in assessment and workplace training, and a graduate certificate in management from the University of South Australia.

For Gunn, "Definitely the high points are being a finalist in the Telstra awards, participating in the AusIndustry workshop, and seeing LearnNow mature, and grow as a team."

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PROFILE

HOA LIEU

AS NSW BUSINESS MANAGER FOR DIMENSION Data (formerly Com Tech Communications), Hoa Lieu draws on the resilience and skills honed growing up during the Vietnam War and seeing the fall of Saigon in 1975.

In 1978 he escaped by boat to Malaysia, which was when he learned one of the main things which has helped him succeed in IT in Australia: "Always maintain positive thinking because things could be worse than they are." Once in Sydney, he used half of the \$5 in his pocket to telegraph his mother.

Lieu's present position demands strong technical and personal skills — a solid understanding of various platforms to ensure logical delivery of services; and accounting, finance and budgeting processes.

Lieu's technical background began with an evening course in electronic engineering at Sydney Technical College. "For anyone wanting to move ahead in IT, technical and management qualifications are essential," he says. He recommends electronics and computing science courses, along with graduate management courses.

In 1985, Lieu began as a field service engineer for Datamatic. "It was an invaluable job because it gave me a break into customer service. I had to present myself in front of the customer on their premises and I survived. I learnt how to perform under pressure."

After various management positions with Datamatic and then Memorex Telex, he moved to Dimension Data in December 1997 as NSW technical services manager, running a team of 25 network engineers. "I had to deliver services in desktop and server technologies, improve staff satisfaction through professional development and technical training, and grow revenue."

Two months later, he was promoted to enterprise systems business manager, managing 50 engineers, consultants and pre-sales staff.

For 42-year-old Lieu, the high point of his work so far has been to take his family to Vietnam earlier this year. "The next goal is heading an IT company in Vietnam by 2005."



Forget using the Internet as a job-finder, even if you have an IT skill that's highly in demand. Bolles rates the Net as the sixth worst way to find an IT job.

The days of a job for life are gone. Utterly. In fact, too many years with one employer is beginning to look suspicious. Don't they know Java, Photoshop and Unix? the wary employer asks. Listing RPG2, COBOL, Fortran IVG and GWBASIC will fill up your résumé, but it won't fool anyone.

Taking control of your career, rather than outsourcing it to an employer is empowering, and in tune with commercial reality. As a partner in a Dallas law firm in the mid-1990s, Todd Wagner faced the fear of a career change when the firm was taken over. He rejected the idea that he needed an MBA or formal training in technology and created Broadcast.com (now owned by Yahoo). Using Helen Harkness' methods, Wagner analysed his skills and realised he was already drown-proofed. His passion for athletics had developed his ability to value and develop a team spirit — an essential ingredient in the success of Broadcast.com.

"THE DAYS OF A JOB FOR LIFE ARE GONE."

Both Gunn and Wagner are good examples of people who have drown-proofed their career. These are the three crucial things that Bolles identifies in *What Color is Your Parachute?*:

1. Decide exactly what you have to offer, in order of its importance to you;
2. Decide exactly where you want to use your skills; and
3. Interview the organisations that interest you most, whether they have vacancies or not.

Bolles' research over 32 years shows that direct approaches to employers you choose yourself are infinitely more effective than job ads or résumé spamming. Think of each role as a project to attain the skills needed for your IT career goals. Look at each role for how you can add value to a company and enhance your own skill sets, personal growth and development.

Examine your IT career in the way a headhunter would. "Look at your CV," says Joshua Sparks, IT director of recruiter Robert Walters. "A headhunter wants to see a progression of project-type roles and an upward arch, with each role enhancing your skill sets, seniority and network in the sector."

If you're serious about drown-proofing your IT career, you must watch for signs that the company, division or project for which you work is faltering or about to change, then engineer a move on your terms — not your employer's or the receiver's.

"This shows a future employer you have a strategic mindset and know when it's time to move," Sparks says. "Consider yourself as a party to a transaction, an exchange of skills," he adds. "Loyalty should be balanced with self-interest."

Bill Gates tweaked Seattle Computer Products' QDOS into MS-DOS, Windows and an empire. It's about delivering the goods, even if they're not yours.

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DESK POTATO WARNING

Many IT workers spend too much time at their desks. Only the advertising industry has more desk potatoes than IT! Below are Monster.com.au's figures, analysed according to sex, age, income and occupation.

ARE YOU A DESK POTATO?

Male	37.3%
Female	44.7%
19 to 24	38.1%
25 to 34	46.9%
35 to 44	44.5%
45 to 54	31.6%
55+ years	23.6%
Less than \$20,000	32.1%
\$20,000 to \$30,000	43.3%
\$30,000 to \$50,000	41.5%
\$50,000 to \$100,000	41.8%
\$100,000+	37.6%
Legal	27.3%
Engineering/Manufacturing	32.7%
Sales and Marketing	33.3%
Construction	36.4%
Banking/Finance	43.2%
Government	44.8%
Human Resources	49.0%
Computer IT	51.3%
Advertising	55.6%

Follow these tips to stay fit.

- Use stairs instead of lifts – a two-minute stair climb is worth 10 minutes of walking.
- Walk, cycle or jog to work.
- Get off the train one stop earlier and walk.
- Park at the far end of the car park.
- Never phone or email anyone in your own building – go see them.
- Go to the gym in your lunch break.
- Eat lunch while strolling in a park.
- Exercise at your desk: deep breaths, stretch above your head, relax; then knees bent, upper body forward, push back arms and buttocks, raise head and shoulders, hold 15 seconds. Feel the tension leave your back.

Peter James, local managing director of recruiter Spherion, describes down-proofed employees as "emergent workers" who are not confined to one age group, gender or race. Spherion US's August study found that such employees want new experiences and opportunities for growth. Emergent workers want an employer who rewards them for performance and they're not afraid of changing jobs frequently.

They are not disloyal – they merely have a different definition of the quality of loyalty. Loyalty is high performance, not tenure, James says.

The majority of emergent workers want high-growth companies with opportunities for personal growth and creativity, rather than daily direction.

Nearly half of these new-style workers think employees must earn job security, rather than seeing it as something a company has an obligation to provide.

Above all, Bolles concludes, break free of the mindset that it's the employee who goes, cap in hand, to the employer, begging for a job. "The best jobs are those that the employer has not created yet," he says. ■

DEMAND FOR SPECIFIC TECHNICAL SKILLS

Technical skill	Strong demand for	Ease of recruitment
Programming languages and development tools	Visual Basic	1
	Java (including Visual Java V++)	100
	Internet development languages	1
Database languages and tools	HTML	1
	JavaScript	100
	XML	100
Operating systems skills	SQL	100
	SQL Server	100
	Oracle	100
Mobile computing skills	Microsoft Windows 2000	1
	Microsoft Windows NT	1
	Solaris	100
Networking architecture and administration	UNIX	100
	Mobile Networks	10
	TCP/IP	1
Applications skills	MS N1 Server	1
	Ethernet	1
	Routing	100
Telecommunications: installation and maintenance	Systems management	1
	Exchange	1
	Database management	100
Telecommunications: operations	Project management	100
	Bus-to-consumer apps	100
	Customer relationship management	100
Relatively easy	Multimedia	100
	Security	100
	Data services and equipment	100
Moderate	Voice services and equipment	100
	Frame relay	1
	Network management – configuration	100
Relatively difficult	Fault and performance	100
	Access and security	100
	Utilisation and accounting	100
Difficult		1
		10
		100

Source: IT Skills Hub research report, Market for Australian IT&I Skills 2000-02

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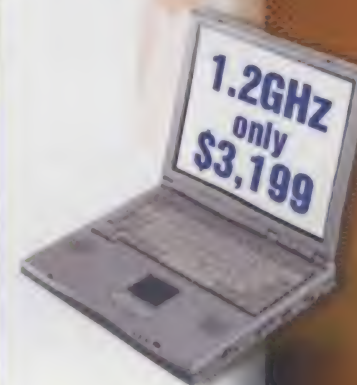


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XML: A PRIMER, 3RD EDITION

BRING YOURSELF UP TO SPEED ON XML. *By Dan Lowden*

Following the "release early and often" strategy common to most open-source projects, *XML: A Primer* aims to keep you abreast of the developments in the XML language, and the likely paths it will follow in the future.

The Primer provides an in-depth overview of the foundations of XML and explains its use on the Web today. The book covers core XML language elements in some depth and

makes important distinctions between the XML you would use to display and format a Web site and the XML that can be used within a Web application. The book then moves on to more advanced areas of XML with chapters covering XML schemas, XSL and building your own markup language.

The focus is on practical deployments of XML, and case studies provide examples of

evolving ecommerce XML applications. Author Simon St Laurent also goes to some length to feature the XML development tools he used in the creation of the examples.

The book isn't sufficient for those who need a technical guide to XML, but it's very useful for people wanting to stay up-to-date.

Publisher M&T Books

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THE COMPUTER ANIMATOR'S TECHNICAL HANDBOOK

TRACE ANIMATION'S HISTORY AND DRAW ON SOME ANIMATION EXPERTISE. *By Alan Crawford*

Computerised animation is used in an amazingly diverse range of fields; from special effects added to individual film cells to fully animated films such as *Toy Story*. *The Computer Animator's Technical Handbook* attempts to provide an in-depth overview of this fascinating world, covering past, present and future methods and techniques.

The authors, Lynn Pocock and Judson Rosebush, begin

by analysing the mechanics and the science behind film and video. Topics ranging from manipulation of time, to the various uses of lenses, shutters and projectors in capturing and portraying film through to the principles of electronic video are all discussed in surprising depth. Various animation methods and tools are also analysed, as are several models and special effects.

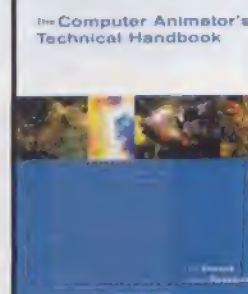
The authors use clear, concise language and plenty of diagrams and colour photos.

Those seeking step-by-step guides to the effective use of the latest animation tools may find themselves disappointed, but anyone even remotely interested in film, video or animation will find this book extremely interesting.

Publisher Morgan Kaufmann

Price \$166.65

ISBN 0121488216



FOUNDATION DREAMWEAVER ULTRADEV 4

CREATE YOUR IDEAL WEB SITE BY MASTERING DREAMWEAVER ULTRADEV 4. *By Alan Crawford*

Foundation Dreamweaver UltraDev 4 aims to provide new Web designers with sufficient skills to create impressive and professional Web pages.

The authors, Rob Paddoc and Spencer Steel, guide you through the design process from installation and software setup. The first chapters explain core concepts, like creating a Web server and using basic objects such as cookies.

More substantive subjects are also covered, revealing UltraDev 4's ready ability to utilise databases behind Web sites. However, the best part for beginners is the section on creating shopping trolleys and login scripts. The hallmark of good ecommerce sites is the effective use of the shopping cart, and this book provides a clear discussion of good shopping cart interface design.

The minimal coding required to create one in UltraDev 4 will come as quite a shock to those used to churning out hundreds of lines of HTML code to perform such tasks.

Anyone who is seeking a step-by-step introduction to Dreamweaver UltraDev 4 will find this book invaluable.

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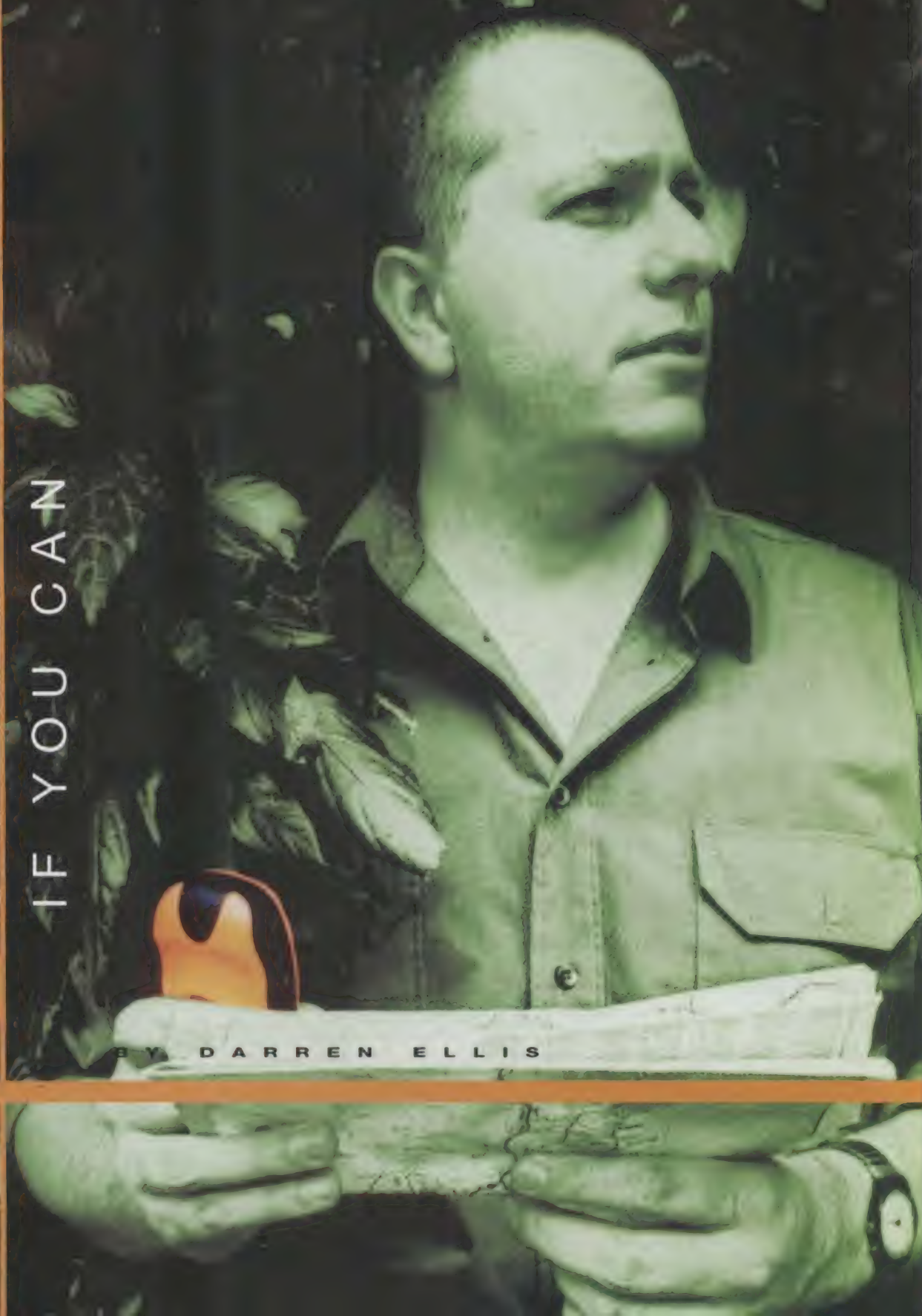
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CACHE ME

IF YOU CAN

BY DARREN ELLIS





USING A GPS RECEIVER, YOU CAN TRACK YOUR MOVEMENTS, GAUGE YOUR TRAVEL SPEED AND DISCOVER THE BEST FISHING SPOTS. NOT TO MENTION FIND BURIED TREASURE. *DARREN ELLIS* SHOWS HOW.

GEOCACHING —THE HIGH-TECH TREASURE HUNT

Geocaching is the latest high-tech sport that is gaining international popularity. It's a lot like following a pirate's treasure map — "30 paces north from the trees, 40 paces east to the rock that looks like a monkey . . ." until you reach X and start digging. However, unlike using a map, you know the exact location of X when you begin — and there's rarely any "treasure" at the end.

The way geocaching works is simple. Someone hides a sealed container with a logbook, pencil, and some sort of trinket inside. They then take the GPS (global positioning system) coordinates of the hiding spot and post it up on the Web for everyone to see.

Other geocachers take the coordinates off the Web, set their GPS receivers and head off in search of the cache.

When someone finds it, they fill out a page in the log book, take the trinket inside, replace it with another of their own, and re-hide the cache in the same spot for the next geocacher to discover. This means that the prizes or gifts inside the caches change over time.

Common items that are found in caches include CDs, gift vouchers, handy items such as gloves or electrical components, or it may just be a bunch of pens. The emphasis in geocaching is not so much the "treasure" but the adventure you undertake to find it.

WHAT IS GPS?

The global positioning system was conceived in the US for use by its military, and has been in operation since 1993. GPS receivers were designed to use satellites to locate a person's exact position anywhere in the world, whether they be on land, in the air or at sea.

Before the system was even completed, it became obvious it could be of considerable benefit to the public as well. So, when the satellites were launched, two signals were broadcast from them — one military, the other public.

The military signal had an accuracy resolution of around five metres. The public signal incorporated selective availability (SA), whereby deliberate errors were introduced into the signal. This means that the accuracy resolution was only within 50 metres of the true location, which prevented the system being misused by non-US military personnel. The degradation of the public signal could be turned on or off on individual satellites, so that accuracy could be reduced in selected areas.

During the Gulf War, the cost of hurriedly outfitting troops with military GPS receivers was considered too high, so they were provided with the cheaper public GPS receivers. SA was then turned off on the satellite network so that the units were as accurate as those of their military counterparts.

For civilian GPS users it meant that their receivers suddenly became much more accurate. Once the war was



Not exactly buried treasure, but no less satisfying to find.

over, SA was restored and the accuracy resolution dropped back to about 50 metres.

GPS FOR FUN

Part of Bill Clinton's 1996 re-election platform was the removal of SA by 2006. Five years ahead of schedule, in May 2001, SA was permanently turned off. Now GPS receivers could get you within five metres of a target, and geocaching became a possibility.

Five metres is accurate but it is not exact, and this is what adds to the allure of geocaching. According to your receiver, you may be standing on the exact location posted on the Internet — or, you could still be metres away from the cache.

Geocaching is growing in popularity in Australia. Six months ago, there were 70 caches hidden around the country; now there are over 230. If you don't already own a GPS receiver, you can buy a simple handheld unit from \$445 (see reviews page 124). The best place to start is www.geocaching.com. This is the default home page for geocachers worldwide, and features comprehensive FAQs, forums and lists of caches which can be searched for by country and state. If you're a newbie, don't worry; the forums are full of helpful geocachers with good advice.

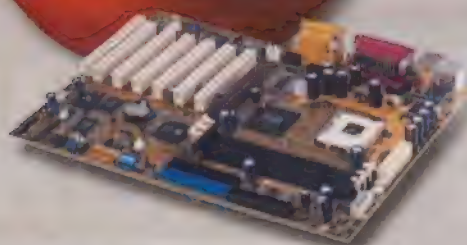
Each cache listing has its own page, with a description of the cache posted by the planters, plus the occasional cryptic hint. A freeware program called EasyGPS is linked to each page, which can be used to detail the cache's location specifics. Unfortunately, it has a US focus, but it can still be used in Australia, especially to find the nearest towns or landmarks. It's a good place to start searching, but once you're out there, all

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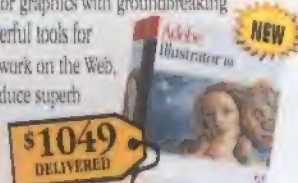
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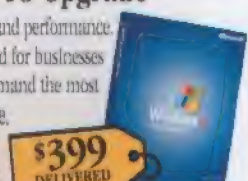
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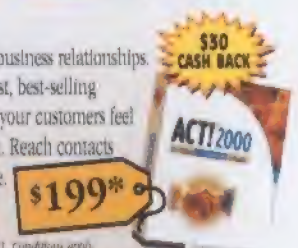
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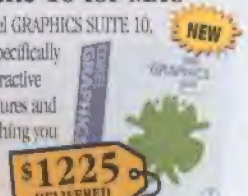
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you have are your wits, your GPS receiver and any insight you can muster into the cunning of the people that hid the cache.

ADVENTURING

To give geocaching a shot, I chose two geocaches that were relatively near to the APC offices in Sydney. I needed a locational fix near the office — which is tough in the CBD because GPS receivers need a good line of sight to the satellites. Luckily, our offices are a minute's walk from Hyde Park. I took a reading from a lamp post in the park (33°52.3055S, 151°12.654E) and used that to search for nearby coordinates on www.geocaching.com.

There are two ways of locating a geocache: the first is to use EasyGPS to get a lock on the area you need to travel to; the second is to use nothing but your GPS receiver and slowly home in on the target. I tried out both

The first hunt took me to bushland in the hills and valleys east of Sydney. It should have been easy to find, because I used EasyGPS and the map links from geocaching.com to tell me almost exactly where I needed to go. From there it would just be a case of driving to the location on the map and doing the final part on foot. Easy, right?

Not quite. When I got to within a metre of the geocache I couldn't find it. Had I been duped? I prayed not — it was extremely hot and I had just scrambled up some ludicrously steep terrain which I wasn't looking forward to revisiting. I checked in the scrub and the bushes, but couldn't find anything.

I then tried walking all around the area, and finally, I found it — 20 metres from the GPS location. Why was the reading so far off? Probably because the steep hillside I was on cut off some of the satellite signals. Who knows — by this stage all I could think of was booty. With a wildlife-startling whoop of joy I plundered my first geocache.

It was hard to decide which of the "treasures" was a worthy trophy for my first cache find. Was it the emergency poncho, the elegant plastic clothes pegs, the techno CD, the tiny bag of

capacitors or one of the children's toys? In the end I chose a stained glass parrot because at least I could display it. Nothing in the cache was going to make me rich — there were no gold doubloons hidden at the bottom, or fist-sized jewels prised from the eye socket of an ancient statue. But by the same token, neither was there a horde of disgruntled spear-wielding warriors to chase me back to my car.

The second cache was harder to find. After about 40 kilometres on the odometer, I finally parked the car to walk the last 50 metres. I wasn't in scrubland, a forest or a park like the first geocache. I was between blocks of flats in suburban Sydney. This is the beauty of geocaching — you can hide a cache anywhere. Some caches have been submerged in ponds, hidden under rocks and leaves, or suspended from ropes in trees.

This cache was hidden well. So well that I couldn't find it. I was right where I was supposed to be — the cache description had an accurate depiction of the exact spot I was standing on — but there was no cache to be found. It was the end of a long day, and I was tired, but I gave the scrub one last search. Nothing.

Logging back onto geocaching.com later, I read the online logs of people who had found that cache before me. It must have been there — perhaps I just didn't search hard enough. I'll be back for that cache, and many more after it.

As I mentioned, the allure of geocaching isn't in the "treasure", it's in the challenge and sense of adventure involved in the search. Some caches are hidden in spots people consider especially worth visiting — a view or a scenic walk that you can enjoy with someone else. Sometimes it's just to create an adventure. Others caches have clues leading to a second cache, which has clues for the third and so on, until you eventually reach the "real" cache at the end.

Geocaching is easy to get into, and has a real community feel. GPS receivers are easy to use and once you've found your first cache, you're hooked. Now I can't wait to plant my own! Keep an eye on www.geocaching.com for a special APC cache appearing soon.



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GPS RECEIVERS

GARMIN ETREX

The eTrex is a 12-channel GPS unit with a small, light design reminiscent of a mobile phone. The menus and options are intuitively laid out and user-friendly, and the control buttons on the sides are designed so the eTrex can be used one-handed. This is extremely handy when trekking or navigating.

The LCD is smaller than that of the Magellan (reviewed below), but it makes up for this with animated navigation and options screens. After plotting waypoints, your movements to or from that point, including direction and the squiggly path you followed, are displayed — very useful if you get lost and need to backtrack.

The unit is robust, and has been waterproofed against accidental puddle dunkings or splashes. This is a great receiver for beginners as it has all you need to get started with geocaching.

Contact GME Electrophone

Phone (02) 9844 6666

Price \$445

Online www.garmin.com

Rating ■■■■



GARMIN ETREX SUMMIT

The eTrex Summit has everything the eTrex has and a whole lot more. The eTrex is designed for land and marine navigation, but the Summit is meant for outdoors use only, and is perfect for geocachers. Along with excellent navigation options, the Summit includes an electronic compass and a barometric altimeter. These tell you the distance and direction you've climbed, as well as your rate of ascent or descent. It also tells you the barometric pressure.

It has a one-handed design similar to the eTrex, but can withstand immersion in water one metre deep for up to half an hour. The screen is the same size as the eTrex's, but the animated travel logs and navigation screens have been tweaked. If you're serious about your geocaching, this is the receiver for you. The unit has been designed for beginners, but this doesn't mean that it lacks functions and features required by seasoned users. It's just less confusing.

Contact GME Electrophone

Phone (02) 9844 6666

Price \$790

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MAGELLAN MAP 330

This unit is different from the other receivers reviewed here. It looks almost the same as the Magellan GPS 315 but there's one crucial difference — it's a mapping GPS. The main screen can display a map of wherever you are, with a basic resolution that includes cities and major roads. You can also buy CDs with finer map details that show minor roads and landmarks.

The MAP 330 has everything the GPS 315 has, so you can toggle from map screens to navigational screens. Like the GPS 315, this unit is a little more complicated to use than the Garmin eTrexes and it requires two hands to operate the buttons. The screen is large, backlit and easy to read, but at \$350 more than the GPS 315, you'll probably only be interested in this unit if the mapping functionality is crucial to you.

Contact Magellan

Phone 1800 644 033

Price \$850

Online

www.magellan.com.au

Rating ■■■■



MAGELLAN GPS 315

Magellan is one of the larger international GPS manufacturers, and its units are renowned as dependable and functional. The best way to compare the Magellan range to the Garmin range is to think in terms of buying a plain OEM product as opposed to a full retail version. The Magellan is plain, boxy, uninspiring to look at and requires some level of technical knowledge to run, whereas the

eTrexes are better designed, look appealing and can be used right out of the box without reading the instructions.

Where the eTrex cannot keep up is in functions and features. The technical design of the GPS 315 means it offers many more configuration options. The front of the unit has a large range of buttons that can be daunting at first, but only a few need to be used consistently (mind you, you do need to use two hands).

When I took it geocaching, the GPS 315 kept an accurate reading of my speed compared to the car's speedometer, whereas the eTrex was out by a kilometre or two.

Contact Magellan

Phone 1800 644 033

Price \$495

Online www.magellan.com.au

Rating ■■■■

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www.magellan.com.au



For retail outlet locations - Freecall 1800 644 033 or Email info@magellan.com.au

HOW GPS WORKS

THE GLOBAL POSITIONING SYSTEM IS INCREDIBLY

COMPLEX. Essentially, the world is being orbited by 24 satellites that emit signals in all directions around themselves, and in doing so, cover every inch of the planet's surface. No matter where you go on land or sea, you can receive the signals emitted by at least three of these satellites at any time.

GPS receivers use signals from the satellites to determine exactly where you are to within metres or centimetres, by trilaterating your position. This is like triangulation, but includes altitude data as well as longitude and latitude.

Imagine that you have no idea where you are, but that you have a GPS receiver. This reveals your distance from orbiting satellites. See below.

I KNOW WHERE I AM, BUT WHERE ARE YOU?

Once a GPS unit locks onto the orbiting satellites, it can keep track of your movements across the planet to within metres.

However, this relies on tracking multiple moving satellites that also have to know where *they themselves* are at all times; since they are in constant motion around the Earth, this is no mean feat.

Each satellite orbits on a predictable course, 17,700 kilometres above the Earth. It sends out repetitive, encoded signals that can be read by GPS units. This signal includes the satellite's location, plus any variations in its predicted course due to the sun and moon's gravitational pull.

Each satellite keeps accurate time with built-in atomic clocks, but GPS receivers use quartz clocks because they're much cheaper (atomic clocks cost between \$100,000 and \$200,000). The receivers store an almanac of satellite positions and timings, so they know where each satellite should be at any time.

At a set time, say midnight exactly, the satellites begin sending out the coded pulses. The receiver then begins playing back its own copy of the signal.

The distance from satellite to GPS receiver is worked out by calculating signal velocity — the electromagnetic waves travel at around the speed of light (in a vacuum, 186,000 miles per hour), so the GPS can accurately calculate the distance by measuring the delay between the receiver's playback and the satellite signal. Because the signals travel at just under the speed of light, a nanosecond difference can be equivalent to hundreds of metres. ■

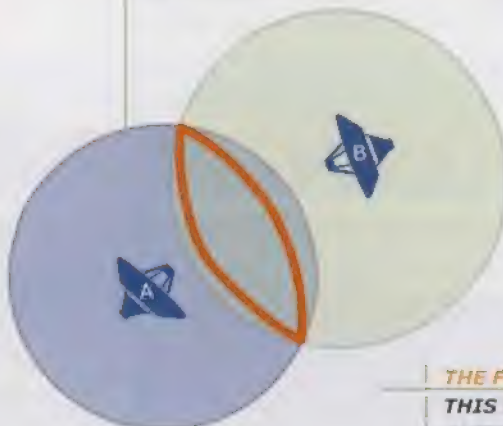


SATELLITE A

YOUR FIRST SIGNAL TELLS YOU THAT YOU ARE EXACTLY 30KM FROM SATELLITE A. THAT'S FAIRLY ACCURATE INFORMATION, BUT REMEMBER, YOU COULD BE ANYWHERE WITHIN WHAT IS A WIDE SPHERE OF OBSERVED SPACE AROUND THAT SATELLITE.

SATELLITE B

A READING FROM ANOTHER SATELLITE, B, MAY SAY THAT YOU ARE 40KM AWAY FROM IT. THIS NARROWS YOUR POSITION TO THE PLACES WHERE BOTH SPHERES INTERSECT.



SATELLITE B

A THIRD READING FROM SATELLITE C NARROWS YOUR POSITION DOWN TO JUST TWO POSSIBLE PLACES WHERE ALL THREE SPHERES MEET.



THE FOURTH READING

THIS PINPOINTS YOU EXACTLY, INCLUDING ALTITUDINAL INFORMATION. IF A FOURTH READING IS NOT POSSIBLE, ONE OF THE TWO LOCATIONS IS REMOVED MATHEMATICALLY, AS IT IS USUALLY OUT IN SPACE.



= SATELLITE



= POSSIBLE LOCATION

MicroGram Computers

www.mgram.com.au

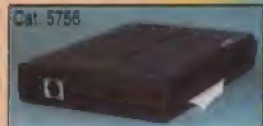
THIS MONTH'S FEATURE PRODUCT

A6 Pocket Printer

Cat. 5756

A self-contained IR or serial printer which will fit in your pocket. Perfect for your PDA in the field.

Cat. 5756-1 \$499



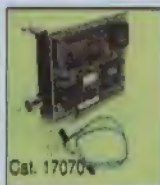
WHILE STOCKS LAST!

Watch Dog timer Card

If your application program locks up, this card will apply a hardware reset to the computer after a selectable period. Available in PCI or ISA. Full details available at HYPERLINK www.pcwatchdog.com

Cat. 17044-1 PCI

Cat. 17070-1 ISA



Cat. 17070

\$165

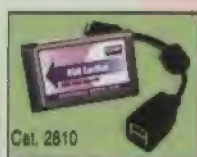
\$165

PCMCIA Cardbus to USB

This Type II 32 bit Card Bus PC card provides 2 standard USB ports to enable any Notebook PC with a Card Bus (not PCMCIA) slot to connect USB products. Suitable for use with Win 98 and Mac OS 8.6 and 9.0.

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Cat. 2810

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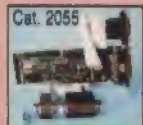
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ISA Multi I/O Card

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Cat. 2055

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Cat. 3372

PCI Ethernet Card for File Servers - Intel 143 10/100 Mbps

When you need real throughput on your network, a network card with its own processor can make a significant improvement by reducing the CPU overhead. This card, which uses the Intel 143 chip (previously known as the DEC 143 chip), is ideal for file servers and heavily loaded work-stations.

Cat. 11332-1 PCI ethernet Card

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Cat. 3393



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Easily capture a picture from your analogue video

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Cat. 3393-1 Video Frame Capture

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Allows the use of your PCMCIA slot to provide a high speed serial port for scanners, cameras, modems, etc. Very low power consumption ensures maximum battery life.

Cat. 2324-1 PCMCIA to High Speed Serial

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Cat. 2324

Magnetic Card Reader

Simply connects between the keyboard and the computer. This magnetic card reader will read tracks on credit cards, Medicare cards, club membership cards etc.

Cat. 8881-1 Magnetic Card Reader

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Power Supply

A temperature controlled regulator varies the speed of the cooling fan in response to power supply temperature. It is virtually silent under normal conditions and is ideal for radio studios etc.

Cat. 8714-1 ATX format for P3

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Cat. 8957-1 ATX format for P4

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Cat. 8714

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Cat. 11657-1 16 way KVM

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Cat. 11654

USB Barcode Scanners

Whether you need a reliable workhorse or a powerful, long range scanner these new USB hand-helds will do the job.

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Cat. 8955-1 Long Range Ultra Wide Scanner

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Provides 2 way conversion with a 512k buffer to minimize data loss.

Cat. SXP1001-1 Serial Parallel Converter

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IR Printer Adapter

Print directly from your Palm to a standard printer via this IR link.

Cat. 18103-1 Ir to Printer for Palm etc

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Cat. 18103

USB Serial Connection

This USB to Serial converter allows a serial device, such as a modem to be connected via the computer USB port. The serial connection is DB9 or DB25 male.

Cat. 2828-1 USB Serial

\$79



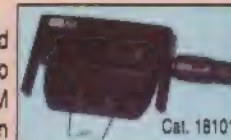
Cat. 2828

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Easily add a standard PS/2 keyboard port to your Palm V, Vx, or IBM WorkPad C3. In addition the adapter includes an amplified infrared port. You can use a standard keyboard or barcode reader with the Palm, or use it as an infrared remote control for your TV etc. Remote control software for the Palm is included.

Cat. 18101-1 Palm universal extender

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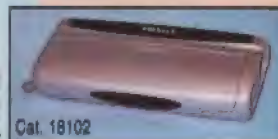
Cat. 18101

Ir Keyboard Adapter

Use any keyboard with a standard PS/2 connector with your PDA. There is no physical connection to your PDA, just an infrared link between the adapter and your PDA. The adapter also acts as an emergency charger utilizing 2 AA batteries.

Cat. 18102-1 Ir Keyboard adapter

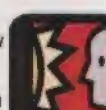
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AFTER THE INTERNET: ALIEN INTELLIGENCE

TRIGGER HAPPY: THE INNER LIFE OF VIDEOGAMES

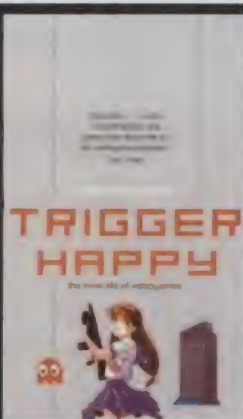
Ever since their widespread uptake in the late 1970s, videogames have had a complex relationship with society. *APC* first reviewed this title late last year and this revised edition offers a broad-ranging look at the phenomenon. The topics are well researched and offer interesting insights into videogame philosophy.

Despite a few flaws, author Steven Poole has produced an intelligently written and well-thought-out thesis.

Publisher Random House

Price \$19.95

ISBN 1841151211



For full review, visit
www.apcmag.com/games

WILL THE 21ST CENTURY SEE THE ADVENT OF ALIEN INTELLIGENCE? READ ON...

By Cathie Kennedy

The 21st century will be the century of alien intelligence, or so James Martin speculates in this book. It will be a time when computers can do things humans cannot, such as recognise certain patterns, learn particular behaviours and assemble logical reasoning too complex for mere mortals.

After the Internet takes a captivating look at the impact alien intelligence will have on the way businesses operate, on our lives, and on society, and in doing so, it uses a definition of "alien intelligence" some readers will be unfamiliar with.

This has the potential to be a dry topic, but author James Martin injects plenty of humour, combined with a realist approach. It's also somewhat of a surprise, given the author's first career was as a rocket scientist researching rocket motors for the British Blue Streak missile!

Broken into three sections, the book focuses on the concept of alien intelligence, its impact, and the technologies involved. The recurring message is that while computers are often hopeless at things humans are good at, they can be great at things humans can't do. As Martin writes, we may have difficulty making a computer able to do things a baby can do, yet we can get it to search through millions of documents from around the globe and find those covering a very specific field. And this, he argues, is the opportunity we have to exploit.

One of the strengths of *After the Internet* is that it provides lots of practical, real-life examples, making it an enjoyable and stimulating read for anyone interested in life (both business and personal) in the information age and beyond.

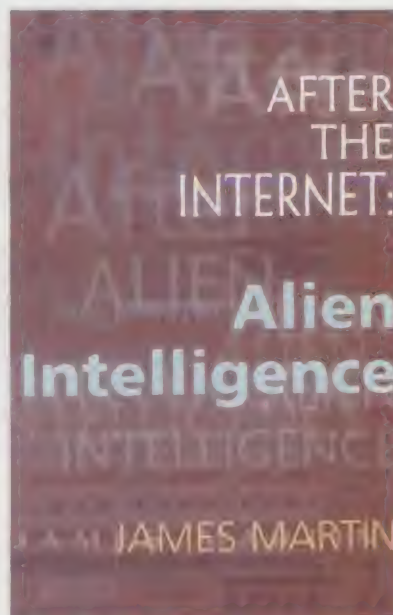
However, no book is perfect. It is disappointing that, with a title like *After the Internet*, the book doesn't speculate more broadly about what's in store for the future of technology.

The section on expert systems focuses mainly on current case studies rather than considering their potential. This minor complaint aside, *After the Internet: Alien Intelligence* is a recommended read.

Publisher Capital Press

Price \$38 (US\$19.56 Amazon.com)

ISBN 0895262800



Speculation on "the next big thing" – alien technology?

INSIDE CISCO

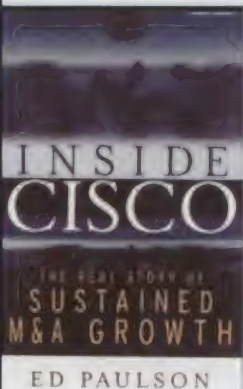
This is "The real story of sustained M&A growth", according to author Ed Paulson. It focuses on Cisco's acquisition strategy (in the past 10 years Cisco acquired over 70 companies) and provides an insight into its business success.

Paulson believes Cisco's success lies in targeting and "assimilating" companies it considers culturally and technologically compatible. The economics described in this tome make it well worth a look.

Publisher John Wiley & Sons

Price \$49.95

ISBN 0471414255



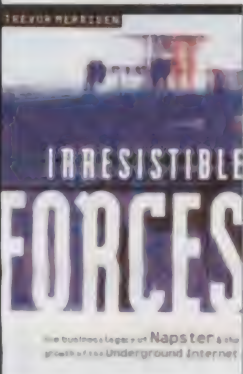
IRRESISTIBLE FORCES

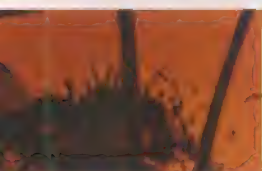
Subtitled "The business legacy of Napster & the growth of the underground Internet", this book promises an in-depth look at one of the Internet Age's most amazing phenomena. Trevor Merriden uses news stories, TV appearances and court documents to tell the Napster story. It doesn't deliver on depth, but is a good read.

Publisher Capstone

Price \$46.95

ISBN 1841121703





COMMANDOS 2: MEN OF COURAGE

PC

SEQUELS ARE RARELY BETTER
THAN THE ORIGINAL, BUT
COMMANDOS 2 MIGHT JUST
HAVE WHAT IT TAKES.

By Alan Crawford



For more of the
latest games reviews, visit
www.apcmag.com/games

You can almost hear that famous marching tune as your men crawl through the Thai jungle towards the Tamarkan Bridge — aka the Bridge over the River Kwai. Hidden from enemy patrols, a Diver and a newly rescued prisoner identify the bridge's weak point on a stolen scale model. Meanwhile, a Green Beret and a Sniper slip silently among the Japanese soldiers, slitting their throats and dropping their

bodies into the river. With the bridge's flaw identified and the opposition neutralised, explosives are carefully positioned along the structure. All that remains is for your troops to find a suitable position to watch the fireworks.

With some great re-creations of World War II movies, Commandos 2 is one of this year's most anticipated sequels. With an expanded line of characters, weaponry, opposition and mission objectives, Commandos 2 looks set to become one of 2001's best sellers — just like its predecessor.

The Commandos series uses a 3D isometric viewpoint to guide a group of elite soldiers through various World War II missions. Unlike the original,

Commandos 2 fully utilises indoor environments, adding a whole new dimension to the game. This is apparent in the huge variety of missions, which range from stealing the Enigma Machine to the climactic escape from the infamously inescapable Colditz.

A variety of colourful characters are at your disposal to help complete the missions — the Green Beret, Diver, Sapper, Driver, Spy and Sniper all make welcome returns. The nimble and deceptive Thief, enticing Seductress and an amazingly adaptable dog called Whiskey are the new additions. Each character has a specialised set of skills, including swinging from wires, climbing walls and sniping from the top of a pole.

With an expanded skills base, improved mission variety and three new characters, Eidos has created a game which is actually better than the original. Fans of the series and newcomers alike will find Commandos 2: Men of Honour a must-buy game. ■

Online www.eidosinteractive.com

Price \$89.95

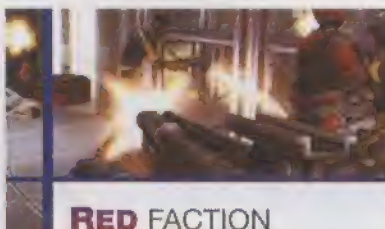


THRONE OF DARKNESS

Based on Sierra's Diablo engine, this game is set in the ancient land of Yamato, in medieval Japan. You take control of seven samurai in a battle with an ancient demon.

Online throneofdarkness.sierra.com

Price \$89.95



RED FACTION

Volition's new first-person shooter crosses Half-Life with Total Recall, placing you at the head of a rebellion on Mars. Its nifty Geo-Mod engine allows you to tunnel holes in Mars' rocky formations with your rocket launcher or mines. It's an enjoyable romp, but a little short.

Online www.redfaction.com

Price \$99.95

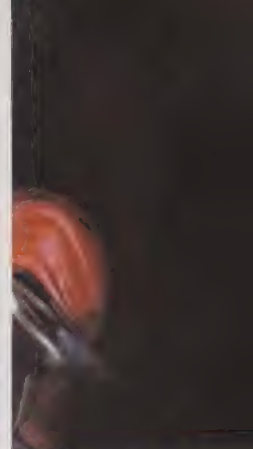


STRONGHOLD

If you're a fan of Sim City-style simulations or RTS titles like Command & Conquer, you'll love this medieval sim. Build a castle, manage its resources and fend off attackers.

Online stronghold.godgames.com

Price \$89.95



PS2

DEVIL MAY CRY

CAPCOM HAS CREATED A NEW BREED OF HERO FOR THE ADVENTURE-STARVED FANS OF THE PS2. YOU'LL NEVER LOOK AT THE "SURVIVAL-HORROR" GENRE THE SAME WAY AGAIN.

By Kevin Cheung

When Resident Evil creator, Shinji Mikami realised that the formula he was using for his "survival-horror" games was simply too old-fashioned, too slow, and far too predictable, he went back to the drawing board and came up with Devil May Cry.

This game takes players straight to the business of killing monsters.

Sporting a mop of streaky white

hair and silky blood-red trench coat, Dante Sparda is the son of a legendary warrior who single-handedly dispatched an army of bloodthirsty demons. He now has to finish the job, taking the fight to (don't laugh, Monkey Island fans) Melee Island.

His sword, which would dwarf any normal man, cuts through the zombie hordes like butter. His "Stinger" move is a solid dash-and-stab that smashes zombies into pieces. His uppercut slash sends monsters floating into the air, during which he draws a pair of Desert Eagles and blasts them.

With unlimited ammo, Dante really lets fly with the John Woo gunplay. He runs, backflips, rolls sideways to avoid blades twice his size, and dances around a dozen monsters as he pumps lead.

Dante can earn new weapons and moves, mostly by collecting orbs that are traded between levels. The shotgun has extra power and is by far the most devastating weapon, although its firing speed is slower. The sword can be switched for a pair of fiery gauntlets when Dante fancies some hand-to-hand combat. Dante can also transform into a winged devil and disintegrate his enemies with lightning bolts from his fingertips.

The game is fully rendered in 3D and features some amazing "camera" work and stylish set designs. Say goodbye to the crusty old rotation system of Resident Evil — push the stick one way and that's the direction in which Dante runs. Simple.

Devil May Cry's attitude, punishing style, and angst-ridden hero are exactly what the PS2 community has been craving. It is without question the coolest and most exciting game to hit the market in a long time. ■

Online www.capcom.com/devilmaycry

Price \$99.95



For more of the latest games reviews, visit www.apcmag.com/games

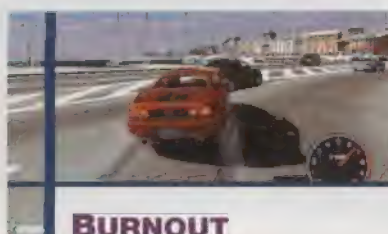


KLONOA 2: LUNATEA'S VEIL

The puzzles could be a tad short for experienced gamers, but this is a beautiful work of art.

Online www.namco.com/games/klonoa_2.html

Price \$99.95 FULL REVIEW ONLINE



BURNOUT

Thought Gran Turismo 3 was good? This is better. Burnout combines the beauty of GT3 with the speed of Ridge Racer V and the dense, hectic traffic of Crazy Taxi. It's by far the most amazing seat-of-your-pants racer on the PS2.

Online www.acclaim.com

Price \$99.95 FULL REVIEW ONLINE



BATMAN: VENGEANCE

Adapted from the animated series, using the same voice actors, this is as good as watching the show.

Online www.ubisoft.com/batmanvengeance

Price \$99.95 FULL REVIEW ONLINE



CHOPPER: SPECIAL EDITION

THUG, STANDOVER MAN OR JUST AN ORDINARY BLOKE WHO LIKES A BIT OF TORTURE? THIS VIOLENT BUT FUNNY INTERPRETATION OF THE LIFE OF MARK "CHOPPER" READ IS A MUST-SEE.

By Darren Ellis

Chopper attracted praise worldwide for its script and direction, but most acclaim went to Eric Bana's performance in the title role. Happy to take liberties with the facts, (the DVD cover proudly proclaims "never let the truth get in the way of a good yarn"), *Chopper* is a ripper of a story.

At times incredibly violent, the movie spins enough Aussie humour into the mix to lighten things up. There aren't many extras on this disc, but what is included is great.

VIDEO

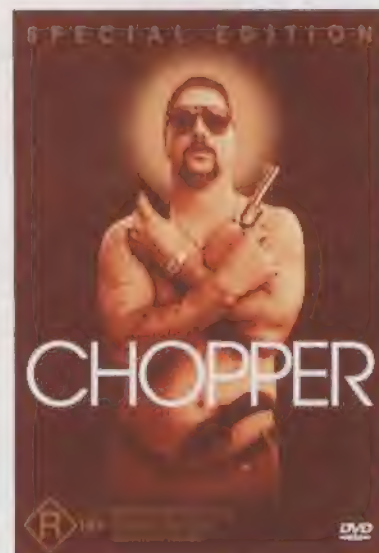
The film is presented in 16:9 widescreen and 1:85:1 formats. The lighting and colours are striking in most scenes, so the movie has an air of unreality at times. This effect translates very well to the DVD format, and the transfer is extremely clean and clear, which is especially noticeable in some of the darker nightclub scenes.

AUDIO

Only available in English, the DVD uses 5.1 Dolby Digital, which is crisp, but isn't used to its full capacity in this soundtrack. The surround effects are occasionally striking, but it's really the centre channel and left/right speakers that do most of the work.

EXTRAS

The most enticing special feature on the DVD is the audio commentary by Chopper himself. It obviously took him a while to warm up to the task



Eric Bana's portrayal of "Chopper" Read is mesmerising.

when the commentary was recorded, because the first 20 minutes is fairly uninspired. Read's not the most verbose of people, but he clearly likes the movie and has an unsettling fondness for the events depicted. It's well worth a listen. A second commentary is also provided by the writer/director, Andrew Dominik.

There's a "Weekend with Chopper" section, which is a compilation of clips from a weekend Bana and Dominik spent with Read on his Tasmanian farm prior to filming the movie. It provides few insights into the man himself, but Bana's incredible ability to mimic is revealed.

A selection of hilarious deleted scenes is also included. ■
Price \$36.95

BEST IN SHOW

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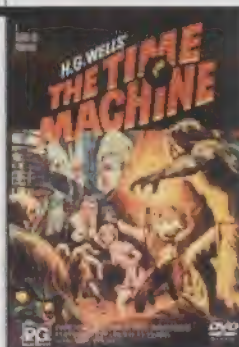
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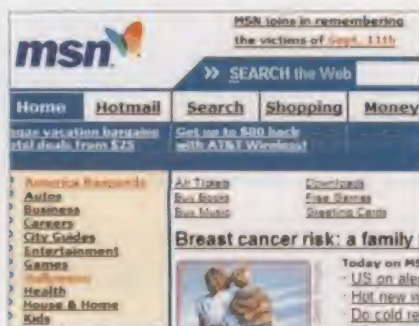
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XP SPEED TWEAKS

IF YOU'VE JUST BOUGHT A BRAND NEW PC PRELOADED WITH WINDOWS XP, OR YOU'VE INSTALLED THE OS ON YOUR EXISTING COMPUTER, YOU DON'T HAVE TO SETTLE FOR THE WINDOWS XP YOU'VE BEEN GIVEN. IT'S TIME TO TWEAK!

By "tweaking" I don't just mean playing with settings that are "open to the public". I'll go through a broad range of major Windows XP tweaks, some of which you can perform easily through XP's own menus, and some of which are clandestine (although not for long!).

Hardcore tweaking used to be geeks-only territory. Terms like "registry editing" and "BIOS settings" struck fear into the hearts of most ordinary users. This is no longer the case; almost all of us, at one time or another, have done a registry edit, usually for the better, and there are lots of programs and utilities that allow for easy, safe tweaking of registry and system settings.



► ClearType, the new font-smoothing system in XP, looks better onscreen than it does in print, but it tends to slow things down.

This article is divided into three sections: Customise, Optimise and Tweak. In Customise, you'll learn how to change the look and feel of Windows XP, using the built-in interface customisation tools. Optimise gives you hints on how to make XP run faster and more efficiently. In Tweak, you'll find the experts' tips for squeezing every last drop of performance out of your system.

CUSTOMISE

CLEARTYPE AND OTHER EFFECTS

Earlier versions of Windows offer a range of effects, including animated menus and drop-shadows. One remarkable new effect available in XP is ClearType, which is a way of rendering fonts with greater crispness and precision. The downside is that it doesn't work on all displays (it works a lot better on LCD panels than on CRTs), and it slows down display rendering a lot. You can toggle it (and many of the other visual effects) by looking in Display Properties, under Appearance, Effects.

The same submenu contains many other effects that should be familiar to Windows users, such as menu

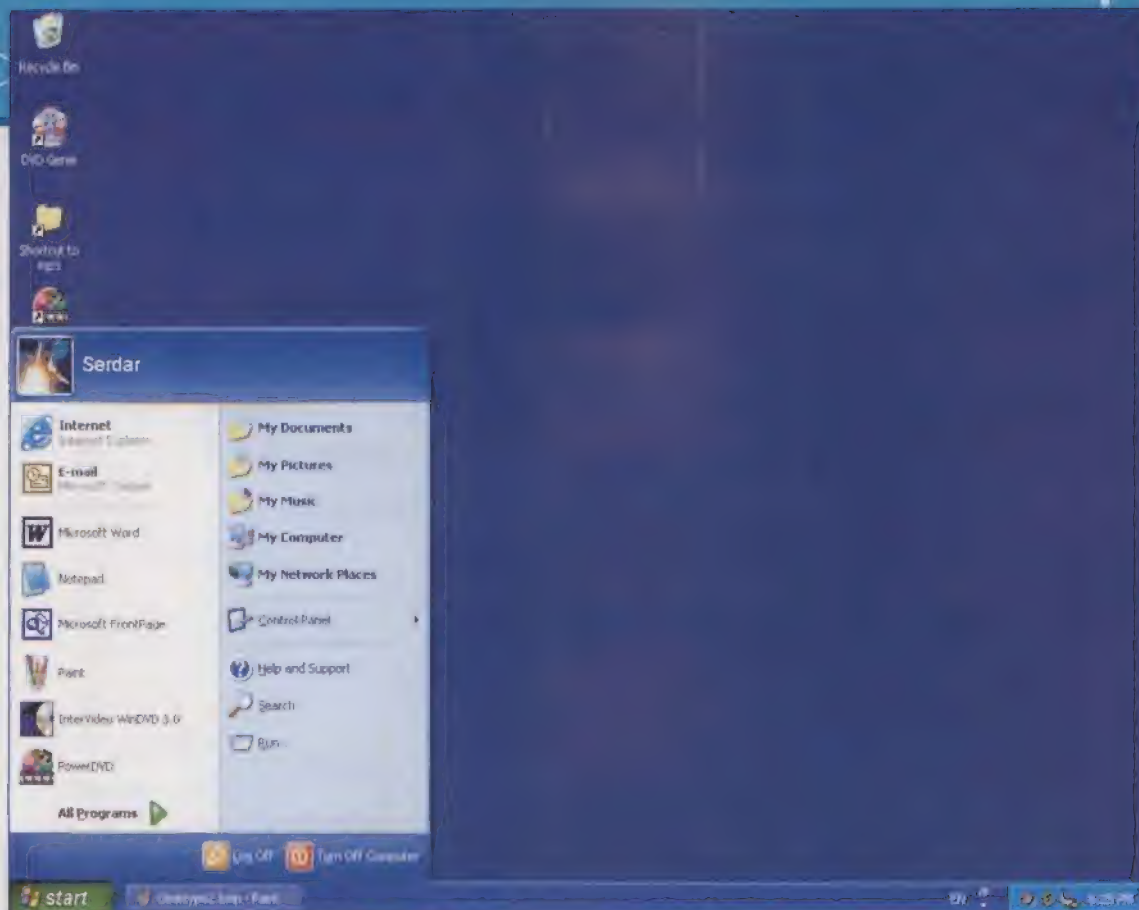
animations and drop-shadows. As nice as they are, turning them all on slows things down quite a bit, especially if you're on a machine slower than 500MHz. The machine I use became sluggish when I turned all those effects on, and it's a 1GHz AMD Athlon!

Animated menus are probably the single biggest CPU waster, and are one of the first things most people turn off, as what they provide — a visual cue for where a particular menu comes from — is something that people quickly outgrow. Unfortunately, not everyone knows that they can be turned off.

THE START MENU

XP's new Start Menu is infinitely more malleable than previous versions. The left column of the Start menu has two icons fixed into place at the top which are fast links to your Web browser and email applications. You can add new fixed icons by dragging and dropping them into place above the divider. Everything below the divider on the left-hand side is placed according to usage; the most commonly launched Windows apps "bubble up" into position in that list. By default, there are four slots, but you can change that number by right-clicking on the Start menu button, selecting Properties, Customize, and adjusting Number of Programs on the Start Menu.

The right-hand column contains icons that appeared on the Desktop in previous editions of Windows. You can change which icons appear, as well as their behaviour in the Start



► Pin your favourite programs to the top left of the new Start menu, or change the icons that appear on the right. Just right-click at the bottom and select Properties.

Menu's Properties (select the Advanced tab after clicking Customize). You can also change how the link to the Control Panel behaves: some people prefer to expand its function to produce a cascading list of the Control Panel icons. This is the same with Administrative Tools, which will be new to Windows 98 users but should be familiar territory to people using Windows 2000.

THEMES AND WINDOW BLINDS

Unlike previous versions of Windows, XP's interface can be heavily customised. This includes the look and feel of windows, as well as fonts and icons. Microsoft uses the term "Theme" to describe the new prepackaged way the look and feel can be delivered. XP includes a standard theme as well as the classic Windows theme, and the company plans to make more available through its Web site, as well as in add-on packs like Plus! for XP.

Before Windows XP was released, Stardock's WindowBlinds app provided similar functionality. In fact, a new

version of the program (currently in beta) integrates with XP's Themes feature, but expands on it enormously. Everything from menus and toolbars to window backgrounds can be made "skinnable", or graphically customisable. The disadvantage to all this is speed: even on a reasonably fast machine (over 500MHz), running WindowBlinds causes display changes to update much more slowly than normal. If you're curious, you can check out the beta of the new WindowBlinds for Windows XP at www.windowblinds.net.

CHANGE DRIVE LETTERINGS

If you don't like the way Windows XP has assigned letters to your drives, you can change drive letter assignments with a right-click on My Computer. Select Manage, click Disk Management, right-click any partition and choose Change Drive Letter & Path. Be warned that if you do this to your system partition or any partition with applications, you could break the applications in question. Your best bet

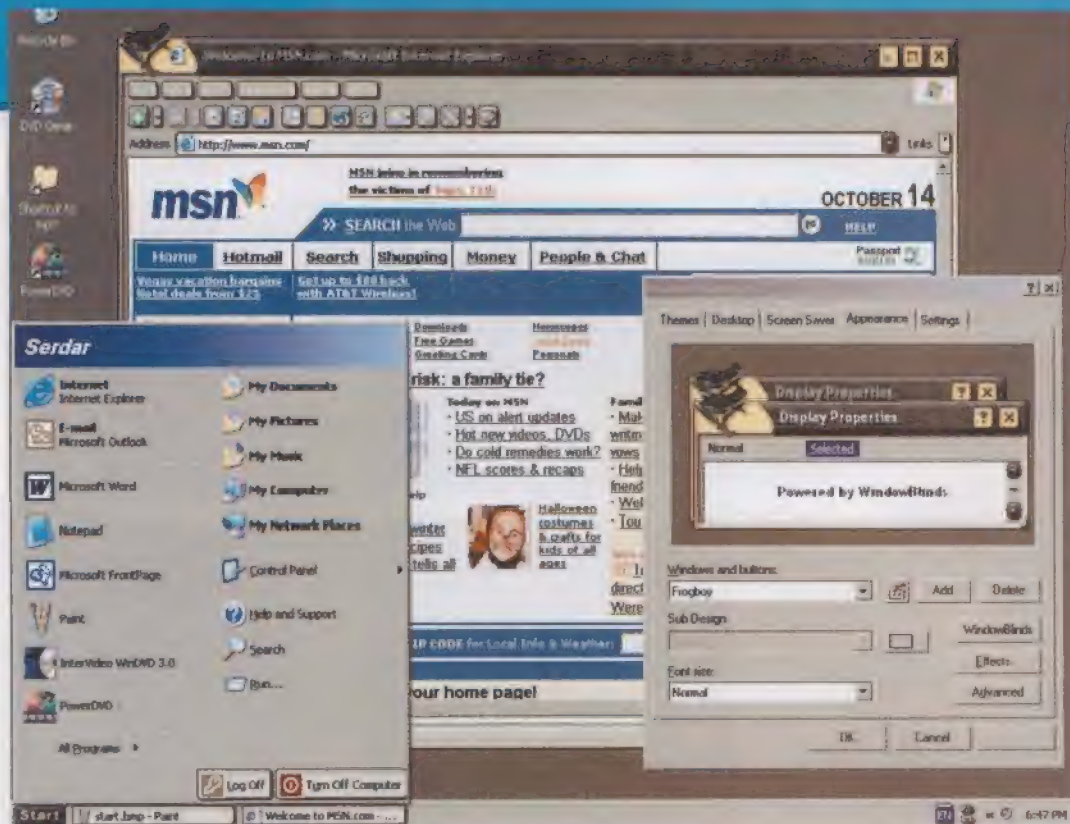
is to do this with removable drives and CD/DVD drives.

OPTIMISE

XP gives you two major choices of file systems depending on what you want to use them for. In short, you should use NTFS for stability and security, and FAT32 for speed. If you're more concerned with not losing critical data and with being able to secure files and folders against prying eyes, use the NTFS disk format. If you want speed, use FAT32. For best results, you can mix and match formats on a per-disk or per-partition basis: NTFS for your system partition, FAT32 for your scratch disks.

TURN OFF THE EYE CANDY

As explained above, advanced look and feel settings come at a cost: performance. The more of this stuff you turn on, the slower the system performance. To shut off the more advanced effects, right-



▶ WindowBlinds allows you to give Windows a total overhaul. The "Frogboy" look shown here may not suit all tastes, but there's a broad palette of customisations to choose from.

click on the desktop and select Properties, Appearance, Effects. Uncheck everything that you don't want to use and hit OK. If you want to get even more radical and turn off *all* the new Windows XP look and feel features, select "Windows classic style" from the "Windows and buttons" drop-down menu in the Appearance tab. This causes the look of Windows, including window elements and buttons, to revert to the 9x/2000 look.

If there's a specific application that you don't want to run with the new look and feel, right-click on the application's EXE file, select Properties, Compatibility, and check "Disable visual themes". This is especially useful for programs that don't make orthodox use of the Windows display APIs (such as a lot of the Lotus applications).

UPGRADE AND TWEAK YOUR BIOS

Before you even install Windows XP, you should consider upgrading your BIOS. Chances are that a BIOS update for the machine you're running has been published since you got your hands on it. Also, if it's been six

months or more since you last checked for an update, check again — there may be something newer that you don't know about.

Here are several key BIOS settings to look for. As every BIOS is organised differently, you probably need to go through it "by hand" or check with the manufacturer for specific instructions on where to find certain settings. Not every BIOS has these settings.

■ AGP aperture

The AGP graphics bus accesses your system's RAM directly to store things like textures and bitmaps. The AGP aperture, which is measured in megabytes, tells the AGP bus how much of the system memory it can access in this fashion. You should have this enabled, but it should never be set to more than 50% of your system memory except in the most extreme cases.

■ UDMA-mode EIDE transfers

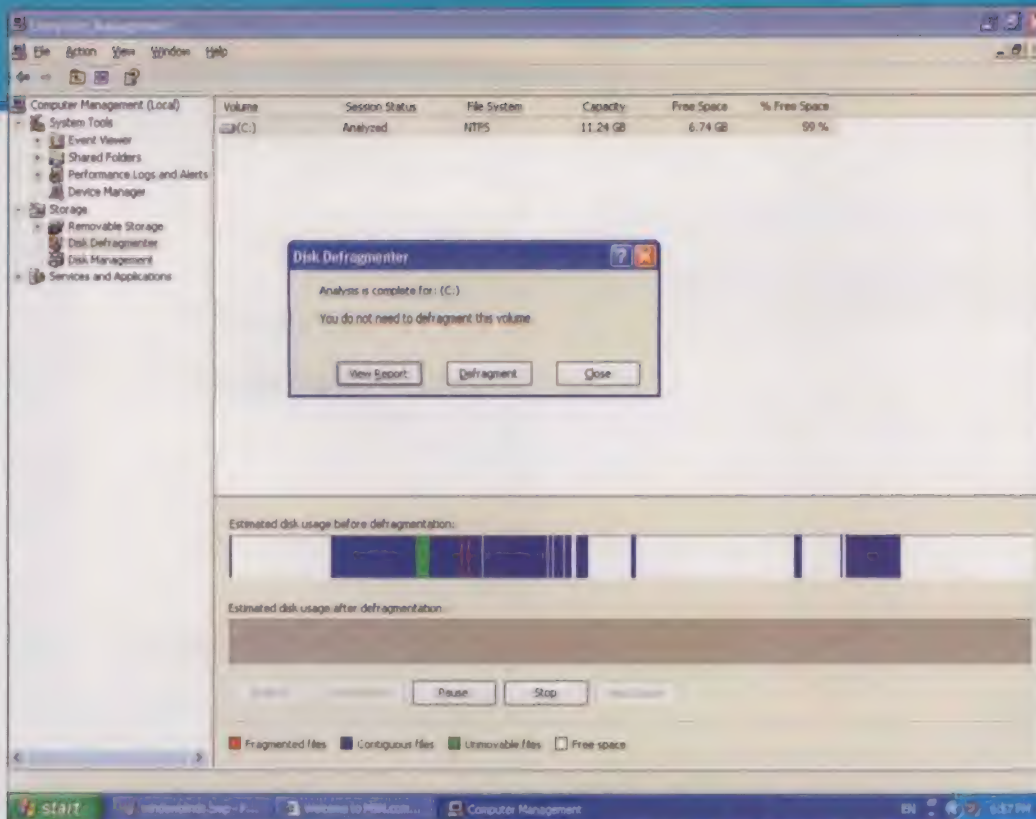
IDE disk controllers usually come set by default to use UDMA transfers. This increases throughput and reduces the CPU usage needed

to transfer information to and from the disk. If your system is behaving sluggishly, check to see if UDMA somehow got turned off in BIOS. (Also, if this is a hand-built system, check that the drive cables you're using are compatible with UDMA drives. Not all of them are.)

■ ACPI/power management:

Because XP is designed to take direct advantage of the power management features in the BIOS, these should be enabled. Bear in mind, however, that when you're running XP, things like the delay before hard drives spin down or the machine goes into sleep mode will no longer be managed by the BIOS — they'll be managed from the Power Options icon in the Control Panel.

ACPI-enabled computers show many devices as sharing the same IRQ. This is normal; ACPI virtualises the way interrupts are handled, based on demand, to minimise conflicts between hardware. This means your soundcard and your 1394 controller won't clash because you've run out of IRQs.



► XP's defrag tool isn't perfect, but it's much better than the 9x version. It's more than worth running on a regular basis.

It's also worth getting video/device BIOS updates. Some brands of video cards and controllers have a flashable BIOS as well. You need to create a DOS boot disk to update these BIOSes (much as you would with your computer's own BIOS), and you also need to make sure you update the BIOS for your exact model of video card.

A great place to get more general information on BIOSes is Wim's BIOS page, at www.wimsbios.com.

USE THE DEFRAG TOOL

If the rather wretched built-in defrag utility in Windows 9x has given you an allergy to defragging your computer, think again. Windows XP's

defragmenter is not only a lot more robust, but a lot faster, and it doesn't restart over and over again! Bear in mind that there are still certain kinds of files that XP's defragger can't move, such as the paging file. Defrag about once a month for best results; more often if you're creating and deleting lots of files.

INSTALLING WINDOWS

XP "CLEAN"

Few people understand the importance of installing Windows XP "clean" — not as an upgrade, but after wiping the resident OS completely off the computer. The benefits are many: the system is generally stabler and runs cleaner, and you can take advantage

of the clean install to better organise your files and applications. There's one major drawback however: you have to reinstall all your applications. Unless you don't have the original CDs or diskettes for your apps, it's better in the long run to reinstall everything cleanly.

If you don't install clean, consider multibooting. Multibooting involves having more than one operating system installed on your computer and choosing which one to boot when you turn the machine on. If you have Windows 98 installed already, for instance, and you install XP, you can elect to place XP in its own directory.

However, this technique really only works best when you can place



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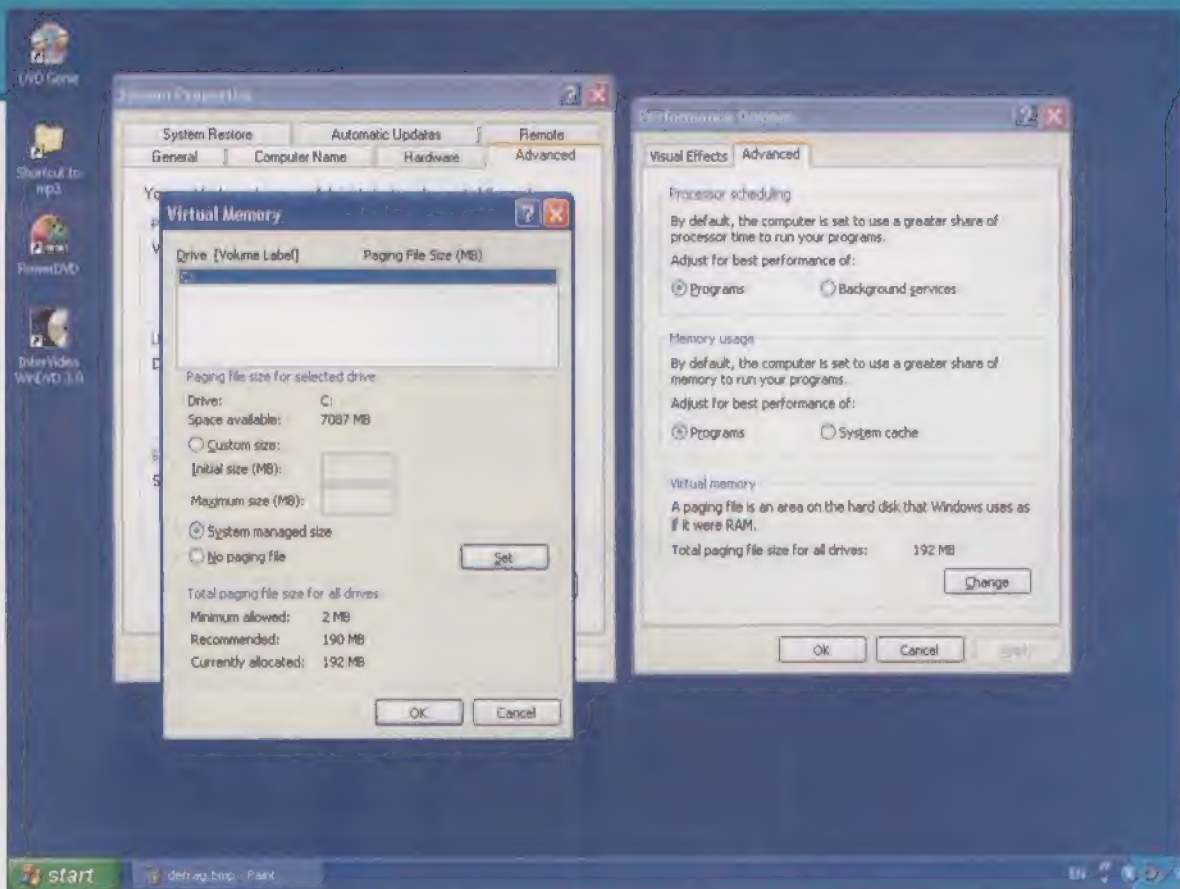
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yourself.





► If you have more than one partition or drive in your system, separate the page file from your system drive.

the new OS on its own drive or partition. If you don't have more than one partition on a drive, you can use a third-party utility like PowerQuest's PartitionMagic to non-destructively split an existing partition. The reason for this? Each installation of Windows creates a number of common directories, such as Documents and Settings. If one overwrites the other, you're in trouble.

TWEAK

SEPARATE THE PAGING FILE

The paging file, also known as the swap file, is where parts of memory are written temporarily to disk when physical memory is running low. To get the most out of this file, put it on a drive or partition that's separate from your system files. You can do this by right-clicking My Computer and choosing Properties, Advanced, Performance/Settings, Advanced, and then clicking Change under Virtual Memory. Use a "System Managed Size" for the drive or partition you

want to use, and select "No paging file" for every drive you want to exclude from having swap space. Make sure you click Set for each drive when you've finished changing its options.

XTEQ SYSTEMS X-SETUP

X-Setup 6, which can be found at www.xteq.com, is the program for performing registry tweaks. It's divided up by topic, so you can drill down to the tweaks you want to make, and safely undo any tweaks without having to wade through the registry manually. Some of the best tweaks in the program, especially those that give a boost to XP, are listed here by the category they appear in.

■ System, Memory, Windows NT/2K/XP I/O Pages

By default, the number of I/O pages in Windows is set to 512KB, but if you have more than 128MB of RAM you can change this and get a much faster response from the file system. With a 256MB system, I get good results with an 8,192KB page size.

■ System, Memory, Windows NT Memory Settings

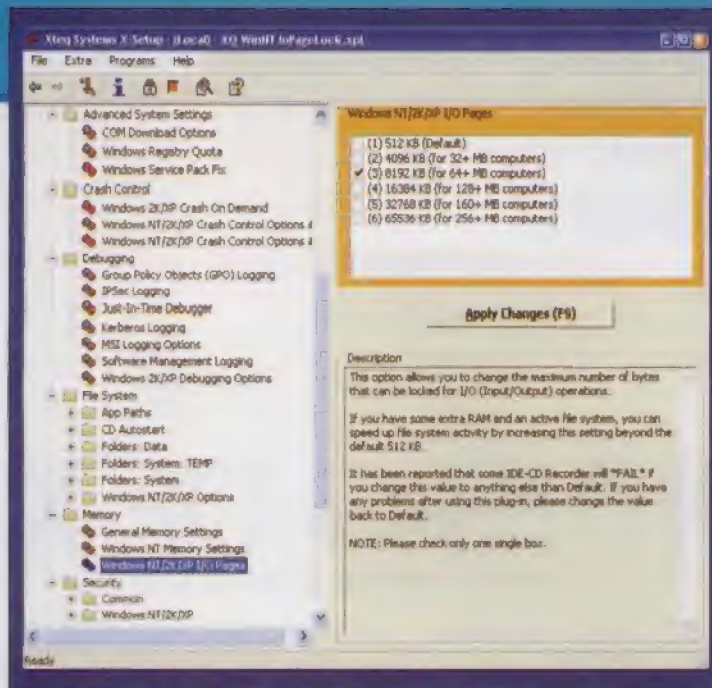
Turning off "Allow paging of kernel" can speed things up a bit, but it also disables the ability to put the system into standby or hibernate mode.

■ System, File System, Windows NT/2K/XP Options

Shutting off the "Enable update of 'Last Access' attribute" (a timestamp to indicate when files were last accessed) makes read/write operations faster, and is useful if you don't use the "last access" attribute much.

■ Network, Auto Login

If you want Windows to log you in automatically without offering you a prompt, you can use the options in this section of the program to enter the user credentials you want provided at startup. Keep in mind that this means your system will be available to anyone as soon as it is turned on.



▶ Xteq's X-Setup makes it easy and safe to perform many common registry hacks.



▶ Write combining accelerates many AGP graphics adaptors, but you should disable it if it causes problems.

■ Hardware, Hard Disk, Windows 2K/XP UDMA

Apparently for compatibility reasons, UDMA/66 transfers are still not enabled by default in XP. You can enable them through this setting; you need to reboot afterwards.

TURN ON WRITE COMBINING

Another feature that speeds performance is write combining. This is enabled by default. The "Enable write combining" checkbox is in the Troubleshoot section of the Advanced Display Properties dialog, and is usually preselected. A feature that AGP video cards take particular advantage of, write combining accelerates the speed at which information is written to the display memory. However, some combinations of drivers, cards and

computers don't deal well with write combining, so if there are weird glitches in the display, you may want to shut this off.

SUSPEND/HIBERNATE/RESUME

One of the design goals for Windows XP was to make it boot and resume faster. To this end, a set of hard-and-fast goals were set: XP must be able to boot to a usable state in 30 seconds, resume from Hibernation in 20 seconds, and resume from Standby (S3) in five seconds. If it can't do this on your machine, there is a set of Microsoft-authored tools and documents that you can use to troubleshoot the boot process and determine what's causing the holdup.

You can get the BootVis.exe tool and a whitepaper on improving startup times at www.microsoft.com/hwdev/fastboot.

Making under-the-hood changes to your system can sometimes have as many bad effects as good ones. XP does a far better job of recovering from abuse than other versions of Windows, but just to be on the safe side, you should log every change as you make it. That way, if something goes wrong, you can go back and undo your last actions.

According to Microsoft, XP is the fastest version of Windows ever. This may be so, but there's plenty more you can do yourself to accelerate things. ■

SERDAR YEGULALP is a specialist in the Windows platform and was the senior technology editor of Windows Magazine until 2001. He publishes the weekly Windows 2000 Power Users newsletter at www.win2kpowerusers.com. He can be contacted at serdar@thegline.com.



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THE WONDERS OF X

CAN'T BEAR TO BE AWAY FROM YOUR DESKTOP? TAKE IT WITH YOU WHEREVER YOU GO WITH THE X WINDOW SYSTEM.

The X Window System (affectionately termed "X") has been the standard graphics display architecture for Unix and Unix-like machines for more than a decade. But did you know that X isn't just a graphical architecture, it's also a powerful *network protocol*? It's this fascinating feature of the X Window System that we'll be exploring in this month's Linux workshop.

THE DEFINITIVE X

"Eh?" I hear you say. "I thought X was just the Linux GUI." Well it is, but it's a *networkable* GUI. To help you understand this, a little history lesson is in order.

Unix was designed to be a multitasking, multiuser, networkable operating system. In the 1970s, before

Xerox started playing around with WIMP (Windows, Icons, Menus, Pointer) — which would later change the face of computing — Unix was controlled through the humble *terminal*, either locally or over a network with **telnet**.

When the time came in 1984 to develop a WIMP system for Unix, the Massachusetts Institute of Technology (MIT), in cooperation with Digital Equipment Corporation (and sponsored by other Unix vendors including Hewlett-Packard, IBM and Sun), set about creating a versatile display system that would extend the multiuser, networkable concepts to the GUI. Three years later, MIT issued the first release (R1) of what became known as the X Window System version 11, or X11.

Since then, the X Window System has evolved under a number of different vendor-neutral, nonprofit groups, beginning with the X Consortium and ending with the Open Group, which holds the rights to the X Window System and oversees development to this day. Members of the Open Group include Compaq, Hewlett-Packard, IBM, SGI, Sun and even the US Navy.

Because the system's licence makes the specifications freely available, alternative free and low-cost implementations have been developed for other platforms. XFree86, the version of X11 used on Linux systems, is an open source

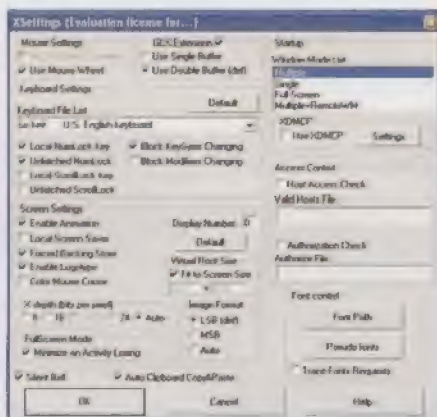
implementation of the X Window System for the common Intel (x86) platform. In addition to x86-based Unices such as Linux and the *BSD varieties, X has also been ported to OS/2 and, as we shall examine in a later column, Windows.

THE NATURE OF X

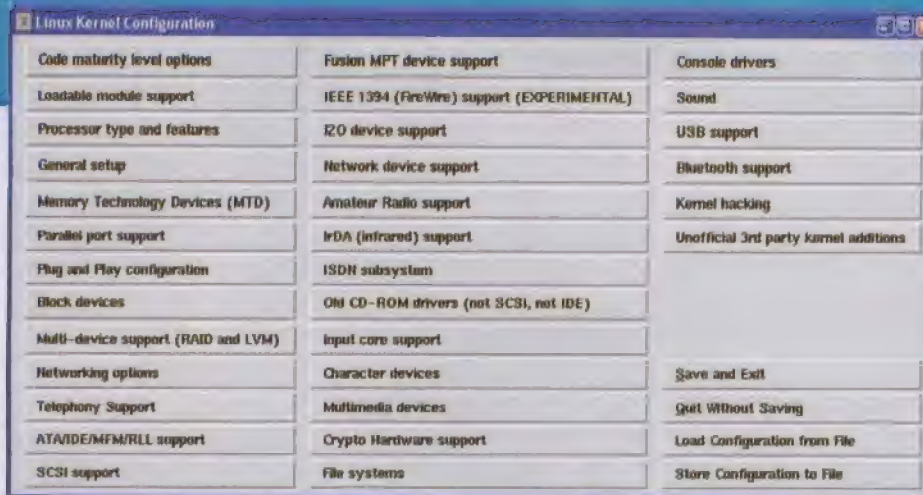
The advantages of a network-transparent GUI are enormous. Programs, even whole desktops, can be displayed not just locally, but also remotely on any machine over a network, anywhere in the world.

This functionality has many uses, ranging from local and remote system administration to client/server installations such as those found in banks, universities, libraries, research institutions and stock exchanges. Even a simple server can manage hundreds of displays over a network so that users are none the wiser that their desktop originates from a remote machine. Centralising processing and storage work like this makes it easy to secure and back up important data, manage thousands of user accounts and settings, and allow logging on to desktops from anywhere in the world without worrying about synchronising data.

Closer to home, this functionality can be used to offer technical support for business or between friends, as a means of having full desktop access to a work machine from home and vice versa, or for accessing locally those few but necessary programs that exist on a remote machine.



► Configuring XFree86 as the Windows X server



► You don't see this every day — configuring the Linux kernel with Windows XP as the "window manager".

X11 101

The functionality of X as a networked display system isn't just a feature of X, it *is* X. Even on a standalone system, every X Window System implementation is broken down into two parts: the *X client* and the *X server*.

You may have noticed during installation that you are prompted to choose which "X server" you want installed. The X server supports the video card on your system, and provides the mechanism by which graphics are displayed, but on its own, it doesn't offer any display (apart from the grey background at startup).

By contrast, X clients are any programs that make use of a graphical display, and do so by sending their information to an X server — be it a local server or a remote one (assuming it has permission to do so). X clients encompass the many programs you use on your desktop, as well as the desktop itself. Environments such as Gnome and KDE are simply collections of various programs that set up the desktop and the way in which it operates.

When a program requires graphical output, it displays to whatever machine is specified by the **DISPLAY** environment variable in the form **[machine IP address]:[display number]** — by default, the local system. If you want to direct all programs to use an X server on another machine, it's simply a matter of setting the **DISPLAY** variable to do so.

Alternatively, if you just want to run a program once and direct its output to a different X server, you can use the "-display" switch (or "-display" for Gnome programs). This switch overrides the **DISPLAY** variable.

KEY COMMANDS

Imagine you've got two Linux machines on a network and you want to run a program from a machine called Bab5 (192.168.0.1), but display it on a machine called Hal (192.168.0.2). How do you do it?

Although not essential, ensuring all the machines on your network are defined in `/etc/hosts` on *both* machines is helpful. The hosts file lists the machine names and IP addresses

Compressing X

As always, when it comes to data and time, compression is the answer. The X Window System comes with a built-in compression tool, called LBX (Low Bandwidth X). Using it is a snap — just run it on the client side (where you run the programs) as follows:

lbxproxy

If the **DISPLAY** variable hasn't been set, you can specify the IP number of the X server. The only requirement is that the remote X server must support the LBX extension. This is compiled in by default on all Unix versions of the X Window System, and even Windows-based X servers (we'll cover them in a later column) support it. However, using compression on a LAN is likely to slow things down because, although less data has to be transmitted, it takes time to compress and decompress at each end.

If you desire even greater speed and don't mind some extra effort, **dxpc** (Differential X Protocol Compressor) provides slightly better performance, but can be a little fiddly to get working. For more information, visit the **dxpc** home page at vigor.nu/dxpc

Another alternative is to log in using SSH with compression (the "-C" switch) enabled, and run programs from that terminal. SSH sets up a compressed (and encrypted) stream when you log in, and all information, including X protocol data, is compressed.

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yourself.



- Two Start bars! Note also **gkrellm**, a system monitoring tool. The stats being displayed are those of the Linux box. To merge two desktops like this, keep XDMCP enabled in WinaXe settings, but choose Multiple instead of Full Screen for the Window Mode.



you want your Linux box to know about, and allows you to then use hostnames in place of IP addresses.

For example, **telnet Hal** as opposed to **telnet 192.168.0.1**.

First, you need to tell Hal that you're happy to allow other machines to send it X11 information (this is normally denied). From a terminal, run:

```
xhost +Bab5
```

Or you can use **xhost +192.168.0.2**. Either is fine, and you don't need to be root to run this command.

Next, simply **telnet** into Bab5 (making sure the telnet service is running!) and run a program using the **"-display"** switch:

```
xterm -display Hal:0 &
```

You should be presented with an **xterm** on Hal that's running from Bab5!

Safe X

The **xhost** command is the easiest way of giving permission, but it's not the safest. In fact, any network administrators reading this are probably freaking out at the idea of using **xhost** to grant access. For a home network, **xhost** is fine, but if your business network is visible to the Internet, or you plan to run remote programs over the Web, use the tool designed to manage X11's authentication files: **xauth**. As always, **man xauth** for more information.

As an alternative, you could run the following command:

```
export DISPLAY=Hal:0
xterm &
```

The **export** command defines or redefines an environment variable. The advantage of exporting **DISPLAY** is that all programs you execute automatically send their output to the remote X server. This single command literally shifts the graphical output of all programs from one machine to another.

You need to specify the screen number, 0, for both of these methods. It's possible to have multiple instances of an X server running on a machine, and you can send output to any one of these servers on a remote machine.

Let's try another example. Rather than spend time telnetting in, you can automate the process with a single command using **rexec** (remote execute):

```
rexec -l [user] -p [password] Bab5
'netscape -display Hal:0' &
```

Understandably, **rexec** access is blocked by default, even though it requires authorisation (better safe than sorry when it comes to security). You can enable it by editing **/etc/xinetd.d/rexec** (or if you're using **inetd**, edit **/etc/inetd.conf**).

Now for the fun (and the reason why remote X access is usually denied). As long as the remote desktop isn't KDE or Gnome (which set their own backgrounds), head to the **/usr/X11R6/lib/xscreensaver** directory and run:

```
./flag -display Hal:0 -root -text 'All your
base are belong to us!'
```

This command is harmless, but it shows that this sort of access allows you to run any program, display any information, or even lock the machine (with the lock program running from your machine and displaying on another machine, it is *your* password that is required to unlock it). So choose the hosts you authorise to connect carefully.

Running programs this way makes it possible to, for example, take advantage of the hardware on another machine — such as a CD burner — by running **xcdroast** on the remote machine and sending its output to your machine.

PAIRING IT UP

Now you know how to run individual programs across the network, but what about a whole desktop? Enter the magic that is XDMCP.

XDMCP, or the X Display Manager Control Protocol, is a secure protocol for XDM, the X Display Manager. XDM is a graphical login for X11 systems — you'll see something similar if



► GDM in action — log into your Linux desktop from your Windows desktop.

you boot to a GUI when you finish installing Linux. The login screen you would have used in the past is an XDM clone such as KDM (KDE Display Manager) or GDM (Gnome Display Manager), which all perform the same task as XDM — to restrict access to known users, and to automatically load the chosen desktop environment upon login. XDMCP is the key behind the corporations, banks and

universities which have hundreds of terminals (or thin client X servers) connected to a central machine.

Understandably, XDMCP access is disabled by default on Linux systems, otherwise your Linux box would happily hand out a graphical login screen to any machine connecting to ports 6000-6063. So first you have to tell KDM or GDM to accept connections — if you're using Mandrake Linux and

Sonic X

What about sound? You can transparently network sound as well, but this depends on the Window manager you are using. Gnome, KDE and Enlightenment all allow for networkable sound, and if the services aren't explicitly defined in the appropriate configuration panels in each environment, they can often be set at the command line when running a program.

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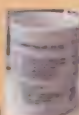
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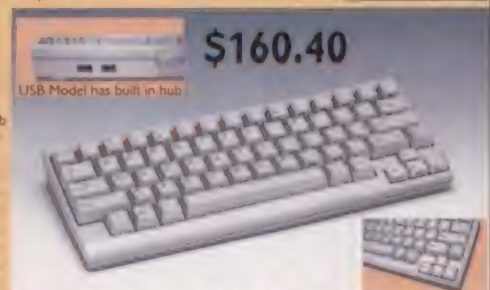


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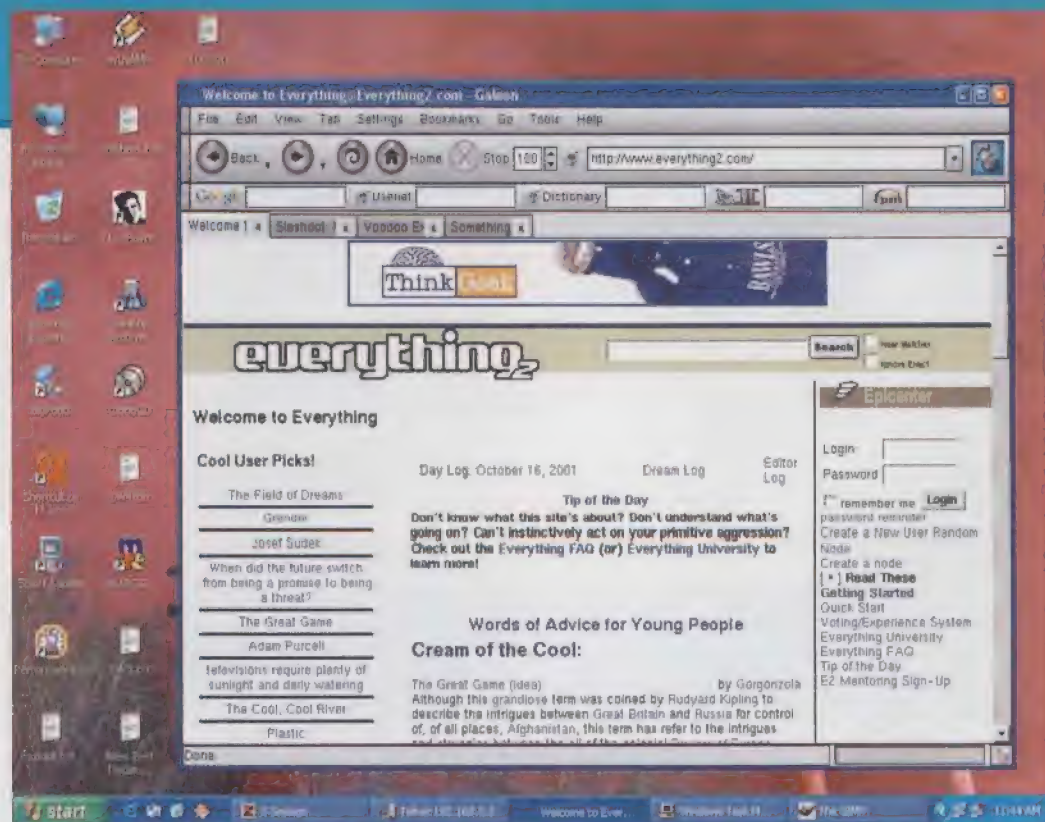
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► Surfing the Web with the Linux browser Galeon under Windows XP means you can have the best of both worlds — running your favourite applications from both operating systems on the same desktop.



have both KDE and Gnome installed, KDM is the default display manager.

Telnet into your remote box and edit the appropriate file accordingly.

For KDM: edit `/usr/share/config/kdm/kdmrc`, scroll down to the bottom of the file and, under `[Xdmcp]`, change `Enabled` to `True`.

For GDM: edit `/etc/X11/gdm/gdm.conf`, scroll down to `[xdmcp]` and change `Enable` to `True`.

When using XDMCP, there's no need to use `xhost` or set the `DISPLAY`, as this is all taken care of.

Next, open up a terminal on your Linux box and run:

```
startx :1 -query [remote machine]
```

If all goes well, a new X server should start on screen 1 and either KDM or GDM will appear (just as when you boot your local machine) and wait for you to log in to the remote box. When you do, you should be able to use the remote machine exactly as you would your local machine. X11 allows for complete functionality this way. It's pretty cool to be able to Ctrl-Alt-F6/F7 to a second full-screen Linux desktop,

and thus control a second Linux box on the one machine.

The potential for networking X11 this way is fantastic. You can set up a Linux machine in your home with just a power cable and a network cable — no need for monitor, keyboard or mouse — and manage it entirely over the network. You can create a multimedia Linux box connected to your stereo system that plays CDs and MP3s, but which is controlled from another machine in the house (just run **XMMS** over the network). You can set up a gateway machine and run browsers and email clients from that box, keeping these services centralised and making it easier to back up everyone's mailboxes. You can even back up the machine without being in the same room. Because X allows you to do anything remotely that you can do locally, the possibilities are limited only by your imagination!

SPEED

Although X is an efficient display protocol, and speed shouldn't be an issue over a LAN, you can still streamline performance.

X can work at a sufficiently low bandwidth to be used over a modem, but most people doing this would run a

compact window manager. Gnome and KDE, as sexy and full-featured as they are, happen to be the bulkiest in terms of network performance. Lightweight window managers such as ICEWM, BlackBox or WindowMaker are faster. Similarly, running just a few programs over the network is faster than a full desktop — so if you don't need a full-screen desktop, don't run one.

Obviously, a 100Mbit/s network can pump more data over the line than one running at 10Mbit/s, making screen redraws much faster. If you're going to spend a lot of time using your new networked Linux configuration and you only have a 10Mbit/s network, consider upgrading. 10/100Mbit/s network cards are cheap, and chances are your network card is 10/100 already. The only extra cost is the \$50 a 100Mbit/s hub costs compared to a 10Mbit/s one.

Lastly, remember that high resolutions and high colour depths mean that more information must be sent down the line — a 1,200 x 1,024 desktop in 24-bit colour is slower than a 1,024 x 768 desktop in 16-bit colour.

If you're planning to use your desktop remotely from home or work, and a modem connection is involved, read "Compressing X" on page 141. ■

ASHTON MILLS is a Linux specialist and editor of *The Linux PocketBook* and *The Advanced Linux PocketBook*. He can be contacted at ashtonmills@bigpond.com.



PEACEFUL COEXISTENCE

SETTING UP YOUR PC TO RUN BOTH WINDOWS 9X AND WINDOWS 2000 GIVES YOU THE BEST OF BOTH WORLDS.

Perhaps the most common question I'm asked about Windows 2000, especially by fans of Windows 9x, is "Can I install Windows 2000 on the same system as Windows 98 and boot between them?"

The answer is a qualified "Yes". Setting up a dual-boot system is a great way for those using 9x to get their feet wet with Windows 2000, especially if they want to assess the better performance and bullet-proof robustness of the more advanced version. If you don't want to totally commit yourself to Windows 2000 just yet, you can retain the old OS while gaining experience with the new one. Also, if you just want to tinker with the new OS, you can dual-boot and experiment relatively safely. Finally, it can also be very useful if you share a computer with other people and you favour a different OS: perhaps 2000 for the heavy duties and 9x for games.

Dual-booting between operating systems is not something that Microsoft covers in any real detail in its documentation, so here's a quick guide to dual-booting between different versions of Windows.

PUTTING THE DUAL BOOT IN

First, make a concerted effort not to install two copies of any version of Windows on the same partition. The reason? Whenever you install Windows

on a partition, it creates a directory named Program Files, into which are installed the basic Windows utilities and the preloaded version of Internet Explorer. If this directory is overwritten by another version of Windows, you may suddenly find that a lot of programs don't run. If you only have one partition, obtaining a program such as PowerQuest's PartitionMagic allows you to add, remove and resize partitions without having to reformat your drive.

Second, make sure you're using compatible file systems. If you're running Windows 9x and you dual-boot to NT or 2000, any drives you create using NTFS (or change over to NTFS) won't be visible from 9x, which can read and write only to FAT16 and FAT32 drives. The same limits also exist in reverse, to a degree: NT 4 can read FAT16 and NTFS, but not FAT32.

Windows 2000 can read and write everything — FAT16, FAT32, NTFS — but if you use FAT32 or NTFS on a system that has Windows 2000 on it, you can only perform disk checks with the Windows 2000 Chkdsk program.

ADDING WINDOWS 9X TO A WINDOWS 2000 SYSTEM

This is the tricky one, since Windows 9x insists on being the only OS on your computer. When installed, it replaces the boot sector with one of its own.

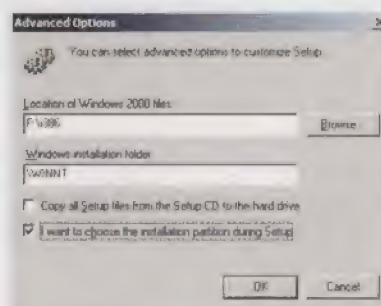
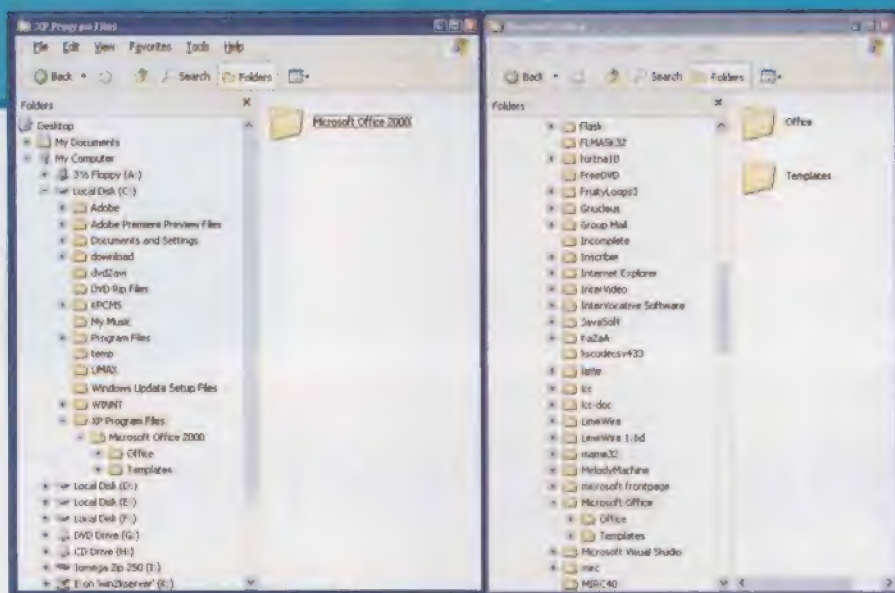


Figure 1: When installing Windows 2000, make sure that you explicitly select the option which allows you to choose which partition to install into.

To get around this, you'll need the NT/2000 installation CD.

1. Create a boot floppy from another Windows 9x or Me computer.
2. Format the empty partition you'll be installing Windows into as FAT16 (or FAT32, if you can) and copy the entire contents of the Windows 9x installation CD-ROM into it. (This is easier than trying to get a DOS-mode CD-ROM driver working, and faster than installing from the CD-ROM — and you can delete the setup files when you're done.)
3. Boot the system using the floppy you've prepared. Go to the partition containing the CD-ROM files and run Windows 9x Setup.
4. When Setup finishes and you reboot into a Windows 9x computer, dig out your NT/2000 CD-ROM and boot that (or the NT/2000 setup floppies).
5. Select Repair from the initial options. This will analyse the boot



► This machine dual-boots between Windows XP and Windows 2000. The left window shows a folder has been reserved for Windows XP applications (specifically Microsoft Office), under "XP Program Files". The right-hand folder shows an Office installation in the Windows 2000 partition on another drive.

sector of the system and recreate the NT/2000 boot loader, along with a 9x option.

6. Next time you reboot, a menu should let you choose either 9x or NT/2000.

ADDING WINDOWS 2000 TO A WINDOWS 9X SYSTEM

This is the easier scenario, since, like Windows NT 4, Windows 2000 includes built-in provisions for dual-booting.

1. As before, make sure you have a clean partition to put the OS in. If you're using disk compression schemes, turn them off, as they can play havoc with drive lettering.
2. Boot the system normally and insert the NT/2000 CD-ROM. One of the options available from the setup menu (under Advanced Options) is the ability to define the target partition or directory during setup. Enable this option (see figure 1, previous page).
3. During the second phase of the Windows NT/2000 setup, point the setup program towards your empty partition and let it rip.
4. After you reboot, you'll be presented with a choice between Windows 9x and NT/2000.

DOING THE APPLICATION SHUFFLE

There's one more question which usually follows the dual-boot one: "How can I share my applications between both operating systems?" If you already have a particular program

installed in one OS, is it possible to have the other OS run it without having to reinstall it?

The short answer is "Maybe". It hinges on the complexity of the program in question. A large, sprawling application like Office is dependent on so many separate components that it's just easier to make two installations. On the other hand, a small, simple application like AOL Instant Messenger can work in both without reinstalling; all you need to do is install it in one OS and run the EXE from the same location for both OSes. It's always worth testing to see if it'll work, but don't expect every application to function properly when shared between two operating systems.

In the early days of Windows — as far back as Windows 3.x — most applications were self-contained. They resided more or less in their own directory and used a plain text INI file (also usually in the same directory) to store their configuration options. Sometimes the program would install a DLL or other components into the \windows directory, but unless this was absolutely required, it was generally frowned upon. This made it easy, or at least easier, to isolate an application from the OS at large.

In Windows 95, most program configuration data was moved into the registry, although a number of applications continue to use INI files. The registry made it possible for

applications to integrate more easily, regardless of the directory in which a program was installed. Unfortunately, it also made it more difficult to clean up after an app. The myriad registry-cleaning programs out there are testament to this.

Most apps these days not only install one or more registry keys — some of which are not obvious — but may install system components which are referenced in the registry as well. The installer program handles setting up all of these components with little user intervention, but not all installers publish a log of the installation actions — and if they do, the log of changes is usually complex and difficult to reproduce manually without making a mistake.

Microsoft Office is probably the single best example of an app that needs to be reinstalled completely in a new OS. There are just too many components to reinstall manually; you could drive yourself batty just trying to name them all. Smaller programs that only reside in one directory and write minimal information to the registry have a better chance of working in both OSes, but even here there is a risk: changes made in one OS may not be reflected in the other, or worse, may overwrite changes in the other.

In short, the best solution is just to maintain separate apps in separate partitions, and to leave the juggling to someone else. ■

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XPLORING MAC

THERE ARE PLENTY OF NEW AND USEFUL FEATURES TO EXPLORE AND EXPLOIT IN MAC OS X 10.1.

Even if you upgrade from version 10.0 simply to improve your system's performance, or to play DVD movies without having to restart in Mac OS 9, familiarising yourself with all of 10.1's new features really is worthwhile.

NETWORKING

Having to add software to get Mac OS and Windows talking on a network has always been a problem and, in some cases, can be fairly expensive. If that's been an issue for you, you'll be glad to know that 10.1 connects to SMB servers straight out of the box.

In the Finder, choose Connect to Server from the Go menu — just as you would for an AppleShare server — and type in the name of the server in the form `smb://server/share`. For example, when I want to connect to the shared folder called `seeme` (which for consistency also has the share name `seeme`) on my Windows Me computer called `Landmark`, I enter `smb://landmark/seeme`.

A dialog appears asking for the workgroup name, username and password, which you can get from the computer's owner or administrator (quite possibly yourself). Enter that information, click OK and you should be in. Possible problems could be that a pre-Windows 2000 system

may need to be reconfigured to use TCP/IP networking rather than the default NetBIOS, or that the share name is longer than 12 characters or contains spaces.

The next time you connect to that share or server, you may find its name in the Recent Servers section of the At pop-up menu in the Connect to Server dialog. To keep it in the menu permanently, select the server and click the Add to Favorites button before you click Connect.

If you expect to add the server to your favourites list, consider entering the URL in the form `smb://workgroup;user@server/share`. That way, after choosing the server from the list, you only need to enter the password.

Apple warns that you risk a kernel panic if you mount more than one SMB server or share at a time, so dismount one (by dragging its icon to the Trash) before mounting another.

Another improvement is that OS X 10.1 handles standard AppleTalk networking, not just AppleTalk over TCP/IP. This means you can connect to folders and volumes shared by Macs running old versions of Mac OS, or by some network servers. Expand the Connect to Server box by clicking the downward-pointing arrowhead, click on

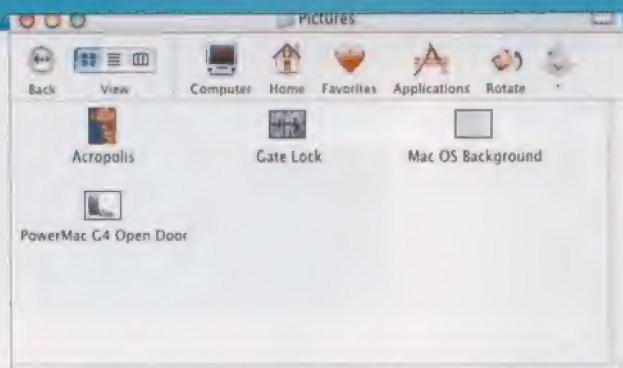
AppleTalk, and your Mac will search for available servers.

My habit is to create desktop aliases for frequently used servers, including my iDisk, in Mac OS 9. Unfortunately, this doesn't work in Mac OS X, so I need to get used to using the Favorites list in Connect to Server.

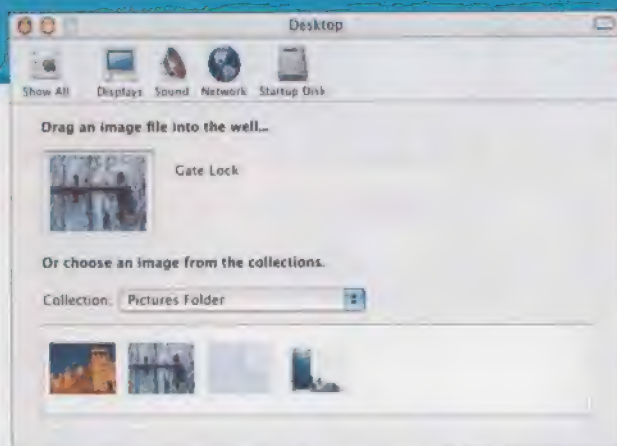
Talking of iDisk, a side-effect of the way Apple has changed the iDisk service to support WebDAV is that the Public folder of an iDisk is now accessible by users of non-Macintosh operating systems, including Windows 98 and later. From Windows Me, for example, you can use the Add Network Place wizard in My Network Places, and type in the full URL of the folder. If you want to try this out but you don't have an iTools account, you can access my public folder by entering `http://idisk.mac.com/swithers/Public/`.

SCRIPTING

A neat feature of the Mac OS X Finder toolbar is that you can customise it by dragging just about any Finder item such as a folder, document or application onto the toolbar. To make the most of this, Apple has created a range of scripts specifically for use in the toolbar. Examples include opening a new window containing the parent of the current folder, hiding all non-Finder windows, and rotating a graphic file (handy if you didn't rotate a portrait-oriented photo when you transferred it from your digital camera). You can download the scripts



- Toolbar scripts put extra functionality at your fingertips. The Acropolis photo has been dropped onto Rotate, and the * script hides all application windows.



- Desktop pictures are now set in the Desktop panel of System Preferences, which provides easy access to your Pictures folder.

from www.apple.com/applescript/macosx/toolbar_scripts.

Another valuable extra is Script Menu (download from www.apple.com/applescript/macosx/toolbar_scripts). Once installed (drag its icon to the menu bar), Script Menu provides quick and easy access to a variety of useful and interesting scripts.

The only problem I've noticed with Script Menu is that its final item — Open Scripts Folder — opens the Scripts folder inside the Library folder within your home folder, rather than the one in the Library folder at the root level of your hard disk, which is where the prewritten scripts live. I've written a quick and dirty script called ~Open System Scripts (the tilde is to force it to the end of the alphabetically ordered Script Menu) as a workaround, and you'll find it on this month's CD set.

You could argue that people should keep their scripts separate from the Apple-provided ones (and that the Script Menu will pick up the contents of their Scripts folder), but I don't share my Mac with anyone else and it's more convenient to have my Finder scripts show up in the same part of the Script Menu as Apple's do.

An exciting new scripting feature in 10.1 is support for Web services. If you haven't come across the term before, IBM describes Web services as "self-contained, self-describing modular applications that can be published, located and invoked across the Web. Web services perform functions that can be anything from simple requests

to complicated business processes."

Think of the feature as a means of Web-enabling applications so that programs running on other computers (rather than a person sitting at a browser) can access them.

Web services use XML (eXtensible Markup Language) and SOAP (Simple Object Access Protocol), but 10.1 makes Web services accessible through AppleScript.

Start with one of the scripts in the Internet Services folder, and change it to use a different service by setting up the parameters and doing something appropriate with the result. Using the Stock Quote script as a starting point, I made simple changes to five lines (one of which was only a comment), deleted the portion that handled user input, and I had a script that looked up the AUD\$ to US\$ exchange rate. You can also find the result (\$A to \$US.scpt) on this month's CD set.

The www.xmethods.com site is a good starting point for identifying Web services if you want to experiment with them. You'll find that the service descriptions match the terminology used in Apple's sample scripts, so you should be able to get started with only modest scripting experience.

You might be thinking, "What makes that exciting? I can easily look up exchange rates on the Web." Indeed, but this feature allows almost any scriptable application to access Web services. For example, I've extended my script to deposit the

returned exchange rate in cell B2 of an AppleWorks spreadsheet (see AW \$A to \$US.scpt and Exchange.cwk on the CD). Cell B1 is an Australian dollar amount, and B3 is calculated from $B1*B2$, giving the US dollar equivalent.

Doing this with one value and one exchange rate isn't very impressive, but imagine updating the local value of a large portfolio of assets in many different currencies and the advantage of using AppleScript and Web services will be clear. The Apple events underlying these AppleScript commands make it easy for developers to have their applications make XML-RPC calls and SOAP requests, so Mac OS X users are well placed to take advantage of Web services.

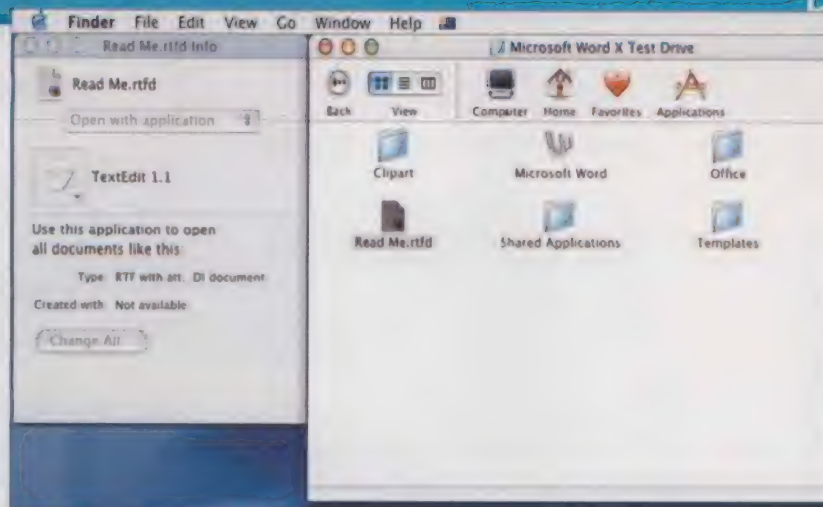
Apple also offers a major collection of scripts for QuickTime 5.0.2 and Mac OS X 10.1 at www.apple.com/applescript/qtas.html. Among the standouts are scripts to automate the conversion of movie files to DV format for import into iMovie, batch resizing of graphics such as digital photos, and simplifying the creation of media skins. Be warned that all the scripts in the collection (around 140 plus supporting files) come in one large archive of about 3.9MB.

SYSTEM PREFERENCES

If you dislike the default desktop picture, you now need to go to Desktop preferences rather than Finder preferences to change it. There's a modest selection of patterns and pictures, but Desktop preferences



► Since iDisk now uses the WebDAV protocol, your Public folder is accessible from Windows and other platforms.



► The Show Info window lets you associate a different application with a particular document or with all files of that type.

gives easy access to your Pictures folder, so you can use any suitable JPEG and TIFF images you've stored there. Copy your collection of Classic desktop pictures into the Pictures folder if you want to use them in Mac OS X, and don't forget there's a good selection of images on the 9.2.1 Installer CD in the CD Extras folder.

You can also use the contents of your Pictures folder for the screensaver — open the Screen Saver panel in System Preferences, and pick Random from the list of screensavers.

Various system status items may appear on the right of the menu bar, depending on your hardware and preference settings. For example, the battery indicator is only relevant to iBooks and PowerBooks, and the AirPort menu is only needed when that card is installed. The volume control has also been moved here from the Dock.

Activate or remove these menus from the corresponding System Preferences panel. For example, if you change screen resolutions or colour depth frequently, go to the Displays panel in System Preferences and tick the "Show displays in menu bar" option. Similarly, modem and PpOE control menus can be selected in the Network panel.

FILE EXTENSIONS

One of the breakthrough features of the original Macintosh was the way a document was automatically associated with the application that

created it. Each document had a creator code (for example, `txtx` indicated SimpleText) that provided this association, as well as a type code (for example, `MooV` for QuickTime movies) so other applications could tell if the file was a type they could open. This mechanism is still available in Mac OS X, but it is being superseded in favour of mappings based on file name extensions à la Windows. The rationale is that non-Macintosh file systems don't handle type and creator information, and also that if you send a Word document without the `DOC` extension to a Windows user, for example, they'll have trouble opening it. There's been an intense debate about this, but it seems to me that we must learn to live with it.

OS X 10.1 has two new features that help in this area. File extensions are hidden by default — to see them, choose Preferences from the Finder menu and check "Always show file extensions". If you only want to show or hide the extension of one file, select it and choose Show Info from the File menu (or from the contextual menu). Choose Name & Extension from the pop-up menu, then check or clear "Hide extension" as appropriate.

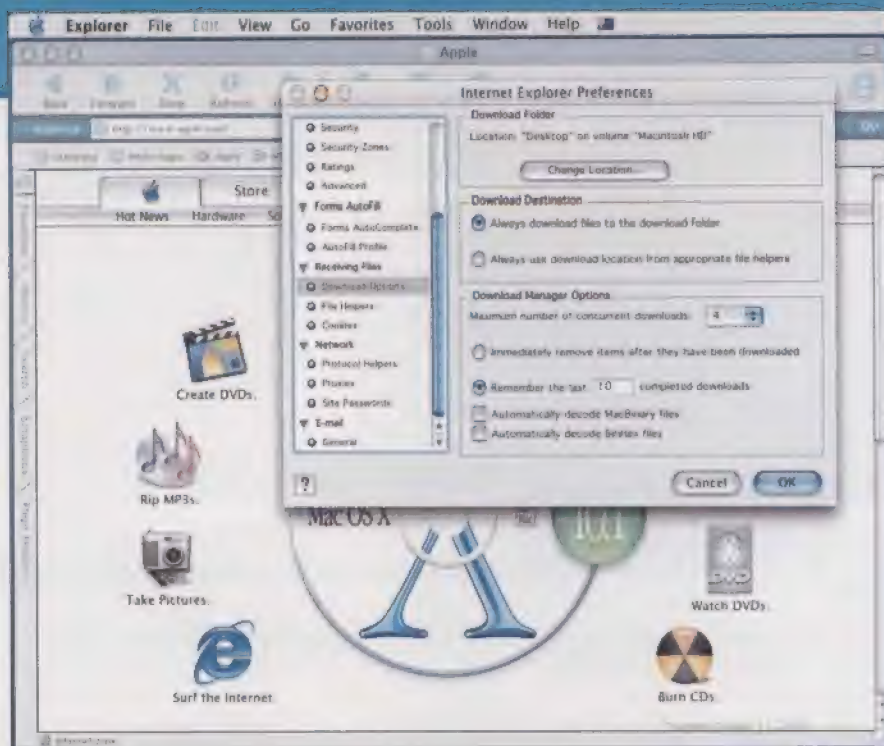
Show Info also allows you to control which application opens the document. Choose "Open with application" from the pop-up menu,

and then click the application icon to see a menu of programs. If the one you want to use isn't there, choose Other and then navigate to your choice (you may need to select "All Applications" from the Show pop-up menu). So far, your change only affects the selected document. To apply it to all files of that type, click the Change All button. Because the desktop pictures from Mac OS 9 open in the Appearance control panel, it's a good idea to reassociate them with Preview in Mac OS X so you don't have to wait for Classic to start up if you double-click one of those files.

SERVICE RESTORED AND DENIED

Apart from bringing DVD Player to Mac OS X, 10.1 also restores the operation of the volume and brightness keys to iBooks and PowerBooks. Plus, you can press the F12 key to open (and in some configurations close) the CD tray. If, like me, you often press F12 accidentally when going for the Delete key, you might not consider this an improvement. It's a shame there's no provision in the Keyboard preferences for modifying this.

Drivers for a much wider range of printers are included (Epson has just announced the imminent release of Mac OS X drivers for several of its printers), and the new mouse driver supports scroll wheels. Contrary to my



► If Internet Explorer's "Automatically decode" options aren't cleared, downloaded applications also run automatically — which is usually undesirable.

experience with mouse drivers for Mac OS 9, the mouse pointer must be over the window contents (not over the scrollbar, for example) for wheel scrolling to work.

If you've been using Mac OS 9's Multiple Users feature, the 10.1 login panel will be familiar, as its default behaviour is to display a list of users. This is especially handy for family use, but if you prefer people to enter their user name and password, select "Name and password entry fields" in the Login Window tab of the Login panel in System Preferences.

You can put a picture beside each user's name when you create the

account in the Users panel of System Preferences. Pick an image from the collection supplied, drag and drop a graphic from the Finder into the dialog box, or click the Browse button and navigate to your chosen image.

Users who need special consideration from the basic input devices will find the sticky keys and mouse keys features — available through the Easy Access control panel in classic Mac OS versions — are also in OS X 10.1 and you can enable them in the Universal Access panel of System Preferences.

If you like Mac OS 9's "double arrows at both ends of the scroll bar" AppleScript trick, you'll definitely be interested in the Mac OS X equivalent. To get it going, open a Terminal window and enter the following command:
defaults write "Apple Global Domain" AppleScrollBarVariant DoubleBoth
Then log out and in again. To restore the normal scroll arrows, go to the General panel in System Preferences and choose "At top and bottom" or "Together".

The bad news — for some of us — is that 10.1's DVD Player does not work with older systems fitted with a hardware decoder, such as the "bronze" PowerBook G3. Owners of

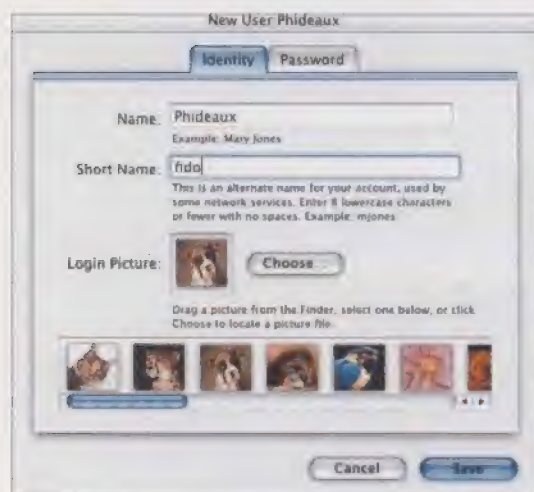
such systems must restart in Mac OS 9 to play DVD movies.

Also, there's no OpenGL support for the ATI graphics hardware fitted as standard in some models. The easiest way to find out if your computer is affected is to open the Screen Saver panel in System Preferences and test the Beach or Forest modules. If the images pan and zoom, you have OpenGL support.

INTERNET EXPLORER

The new version of Internet Explorer is generally an improvement on its predecessor, but it has one unfortunate habit: BinHex-encoded applications are automatically run after downloading. This is a serious security risk, so disable this feature to ensure you have a chance to scan downloads for viruses before running them. Choose Preferences from the Explorer menu, select the Download Options panel, and uncheck "Automatically decode MacBinary files" and "Automatically decode Bittorrent files".

Internet Explorer 5.1 Security Update prevents the automatic execution of downloaded files, and can be downloaded through the Software Update panel in System Preferences. ■



► Use a distinctive picture to help pre-literate family members log in to a shared Mac OS X system.

STEPHEN WITHERS is one of Australia's foremost Mac writers and was formerly editor of Australian MacUser magazine. He can be contacted at swithers@ozemail.com.au.

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TAPE TERMINATOR

HOW DO YOU TURN DV FOOTAGE INTO A VIDEO CD? THIS MONTH'S DV WORKSHOP SHOWS YOU THE ROPES.

CD-R is gaining legitimacy as a viable media for video. It is inexpensive and incredibly portable, it can deliver close to VHS quality, and an increasing number of DVD players will now play back video CDs.

The desktop video revolution is gathering momentum, and one result is that the variety of output media available is increasing dramatically. When desktop video began, video makers aimed chiefly to maintain quality throughout the compression process. They would manipulate their footage in an editing application and then record it back to tape.

Tape is still important today, but the arrival of video CD (VCD), super video CD (S-VCD), DVD and even Web video has changed the expectations

of both video editors and their prospective audiences. It has become clear that video makers can easily and inexpensively capture very high-quality footage with a DV camcorder, download it to a PC, edit it and then output it to virtually any media.

Over the past six months, the intersection of a number of technologies has given rise to an increasingly diverse range of media. FireWire cards have slipped below \$150, a number of inexpensive professional-level editing applications have become available with encoding

built in, and the cost of CD-R/CD-RW hardware and media is now low enough to make it attractive both to PC owners and desktop videomakers.

So, how easy is it to record video on to CD? Where can you watch a VCD? What software and hardware applications and equipment do you need to convert video to VCD? What other formats are available? Can VCDs be made interactive? These questions and more are answered below.

WHAT IS VCD?

This VCD workshop will take you step by step through the process of recording video from a camcorder to the computer's hard disk, manipulating it on the PC, then outputting it to

S-VCD

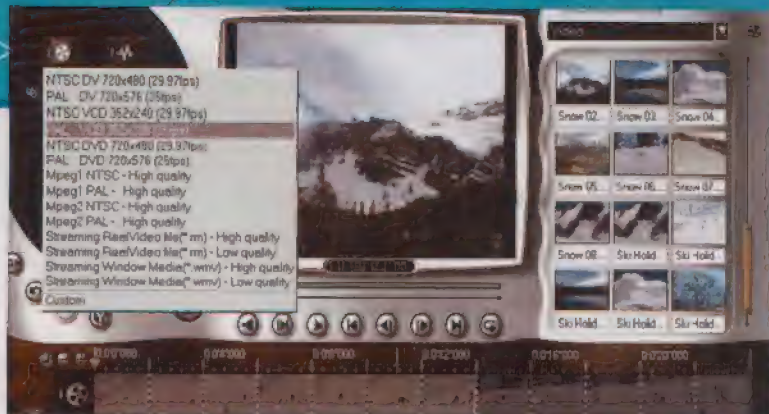
Another MPEG standard that has recently been introduced provides a much higher quality than VCD. S-VCD stands for super video CD. S-VCD is like a VCD, but the video is stored as a variable bitrate MPEG-2 (VCD is a constant bitrate MPEG-1) file, exactly like DVD movies.

On average an S-VCD can hold up to 35 minutes of footage (compared to VCD's 74 minutes) on a 740MB CD. While the video is encoded as an MPEG-2 file, the quality is not nearly as good as DVD — it's about equivalent to S-VHS tape.

S-VCDs can be played on some standalone VCD/S-VCD and DVD players. All CD-ROM/DVD-ROM players can play S-VCDs, as long as the PC has a software DVD/S-VCD software player installed.



► If video is captured as an AVI file, it is best to add titles, graphics and sound, then edit it before converting it to an MPEG-1. Here the raw video footage is edited in Ulead MediaStudio Pro 6.5.



► Most editing programs offer the ability to save edited footage as either an MPEG-1 file or a specific VCD file.

a variety of formats on a CD-R or CD-RW. But first it's necessary to understand the format.

VCD is a variant of the basic CD format and was introduced by Philips, Matsushita (Panasonic), JVC and Sony in 1993. It is particularly popular in Asia, where about 3 million consumer-level standalone VCD players and around 100 million VCD titles are sold annually. VCD can also be played on a Sony PlayStation with a VCD add-on.

The format is a predecessor of DVD. VCD quality is roughly comparable to VHS tapes, while DVD quality is comparable to laser disc or better. MPEG has become the dominant compression scheme for the distribution of full-motion digital video.

A VCD holds video and stereo audio assets in up to 98 A/V tracks. An A/V track contains data that can be video, audio, or still images (up to 2,000), with or without audio. Basically, it's possible to think of a VCD as an audio CD which has been expanded with moving pictures and onscreen navigational control.

From a video perspective, the footage must be compressed using an MPEG-1 (.mpg) compression algorithm (method) to make it available to create a VCD. The term MPEG stands for Motion Picture Expert Group. This group (mostly representing the consumer electronic manufacturers) simply defined one of the compression methods for the creation of digital video. The MPEG algorithm is efficient at removing redundant material between frames of video footage.

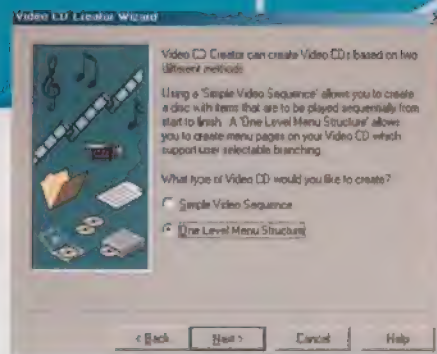
There are actually a few MPEG

standards: MPEG-1 is for VCD, while MPEG-2 is a higher quality audio and video standard and is the basis of DVD. MPEG-4 is a streaming video for the Web standard. In August, the MPEG forum confirmed the replacement for MPEG-4, which is called MPEG-7. The new MPEG-7 standard will be the basis for easily and efficiently compressing video for Web streaming.

Why does video need to be compressed? If you look at the data rate of digital video from a camcorder, you'll soon get an idea of the problem. DV runs at 3.5Mbits/s, but a VCD has 650 to 700MB of data storage available. Not only is the data rate too fast for a CD to operate, but it would only allow three minutes of DV video and audio to be recorded to the CD.

When raw video and audio are treated with the MPEG-1 algorithm, files are highly compressed, making it possible to record approximately 70 minutes of full-screen video and CD-quality 16-bit audio on a conventional CD-R/CD-RW disk. The MPEG algorithm makes it possible to compress video between 100:1 and 200:1 (100 to 200 times smaller than its original size).

The advantages of VCD over analog, tape-based video is that it delivers random access across an entire production, there is no degradation of media over time, discs are easy to transport and store, and the technology is independent of broadcast standards (NTSC and PAL) when viewed on a PC (consumer VCDs and DVDs may have problems with broadcast standards).



► Most CD burning software can burn VCD. Some software also allows menus to be constructed.

MPEG-1 AND AVI CAPTURE TIPS

STEP 1: PREPARATION

Before you capture footage from a video source to the PC's hard drive, it is best to configure the system. These simple steps will ensure a glitch-free capture:

DEFRAGMENT the hard disk you'll be using for capturing the video.

CLOSE ANY WINDOWS, applications or programs that you don't need

EXIT, DISABLE OR PAUSE any System Tray tasks.

DISABLE/EXIT any antivirus or firewall software running on the PC

STEP 2: EDITING

MPEG-1 capture cards are bundled with specific editing applications that manipulate and edit the raw MPEG-1 files to a certain degree. If you're using a FireWire capture card, you can choose whichever editing package you want to manipulate the video and add effects, titles and graphics to the video before you encode. All of the editing software listed below has the ability to encode using the software from the edited AVI file to MPG within the application. Some of the most popular video editing software applications include:

ADOBE PREMIERE 6.0 — www.adobe.com

ULEAD MEDIASTUDIO PRO 6.5 and **VIDEOSTUDIO 5.0** — www.ulead.com

PINNACLE SYSTEMS STUDIO 7 — www.pinnaclesys.com

MGI VIDEOWAVE 4.0 — www.mgi.com

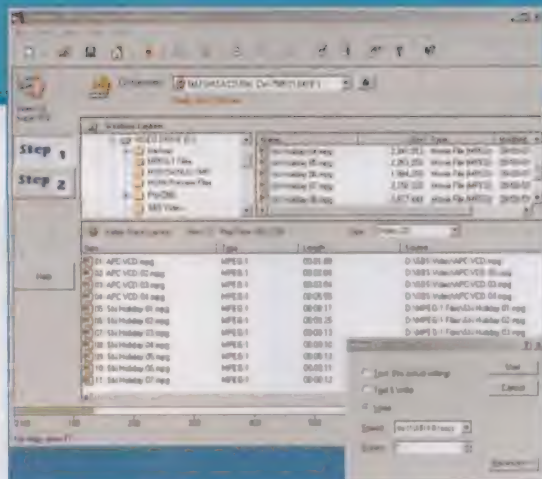
PERSONALSTUDIO — www.adamotion.com

SONIC FOUNDRY VEGAS VIDEO 2.0 and **VIDEO FACTORY 2.0** — www.sonicfoundry.com

(Note: Some of these software programs can be downloaded from the Web as trial versions and then purchased once you have decided which is the most appropriate for you.)

ONE OF THE BEST standalone MPEG-1 software encoding applications that can be used in conjunction with the editing applications listed is **Cleaner 5** (www.media100.com). It can encode the footage after the AVI footage has been edited and rendered.

► If you're simply burning MPEG-1 files to a CD-ROM, there are any number of programs, like NTI CD-Maker, that provide easy layouts and reliable copying to most CD-R drives.



► Easy CDCreator provides the ability to preview the video files and then add specific ones to the menu structure.

MPEG-1 AND AVI CAPTURE TIPS

STEP 3: ENCODING

If you're using an MPEG-1 capture card, the video on the PC's hard drive will already have been encoded and it will be ready to be authored and mastered as a VCD. If the file is an AVI, the encoding process involves converting the edited material to an MPEG-1 file.

THE ENCODING OR COMPRESSION process for transferring AVI video to MPEG-1 for VCD creation has two aspects that need to be understood. VCD allows data transfer rates of up to 1.14Mbps/s. To achieve this, editors adjust either the video's frame rate (full-motion PAL video runs at 25 frames per second) or adjust the frame size (PAL has a full frame size of 720 x 576 pixels, while full-motion, full-frame NTSC video runs at 29.7fps and 720 x 480 pixels).

THE THING TO REMEMBER about the encoding process is that, generally, the lower the compressed bit rate, the greater the degradation of the video images. The objective of the MPEG-1 encoding process is to compress the video and audio streams to the specified data rate (1.15Mbps/s) while appearing as lossless as possible.

THE SPECIFIED VIDEO FRAME RATE and size for VCD production is:

- 352 x 288 @ 25fps for PAL
- 352 x 240 @ 29.97fps for NTSC

This must be set for the video to be compliant with the VCD standard. If the video is not encoded at the correct settings, the VCD will not play in standalone VCD players and is also unlikely to play as a VCD in a PC.

THE AUDIO FOR VCD also needs to be set accurately. For VCD, the audio must be encoded at 16-bit stereo at 44.1MHz, sometimes referred to as CD quality in some of the encoders.

IF YOU'RE CAPTURING an AVI file via a FireWire card, make sure the audio capture rate is set at 44.1MHz (not the native 48MHz rate of DV). Most MPEG encoders will not support 48MHz, even if the soundcard and capture card in the PC do, so make sure the audio is set correctly.

In addition, the VCD format can display MPEG stills with text, graphics and background audio. This provides enhanced interactive control by linking video files to graphical menus and supplementary material such as commentaries and discographies.

Video is encoded on the disc as a list of tracks, just like on an audio CD, and also as a file system like a CD-ROM. This dual mastering feature allows the video CD to be played back on either a simple consumer-type device with typical transport controls such as Play, Stop, Next and Previous Track commands, or on a PC with more sophisticated navigational controls.

Since a video CD player must decode the MPEG content, consumer-type players are outfitted with MPEG-1 decoder chips, while computers require either sufficient performance to run a software MPEG decoder, or an onboard MPEG decoder chip. The most widely used software decoder is Microsoft's ActiveMovie. ActiveMovie software can be downloaded from www.microsoft.com.

MAKING A VCD

There are two main ways of capturing video to create a VCD. The video can be captured from a DV camcorder using a FireWire card and saved as an AVI file, or it can be captured from the analog output from a DV camcorder (or other video source) using an MPEG-1 capture card. This creates MPG files directly on the PC's hard drive.

If the video does not need to be edited, capturing directly to MPEG-1

has some advantages over capturing to AVI. These include:

- Capturing and encoding take place in real time;
- MPEG-1 capture uses much less disk space than AVI capturing; and
- MPEG-1 video can be burnt to a video CD without any additional processing.

However, direct MPEG-1 capture does have a disadvantage. Because of the way it's compressed, an MPEG-1 video stream is difficult to cut and edit compared with editing AVI files. MPEG compression can remove some frames of video and therefore makes editing accurately and adding effects, titles and graphics a difficult process.

There are several MPEG-1 capture cards available:

- Pinnacle Systems Studio MP10+ (www.pinnaclesys.com);
- Dazzle DVC USB and Dazzle DVC2 (www.dazzle.com); and
- Broadway Pro 4.0 (www.b-way.com).

Input to an MPEG capture card can be from any analog AV source, such as a camcorder, VCR or TV.

Many video editors prefer to use a FireWire capture card to create AVI files first. There are a couple of reasons for this. To begin with, AVI capture creates very high-quality files that can be manipulated and edited easily, and the finished AVI file is then converted to MPEG using software encoding.

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MPEG-1 AND AVI CAPTURE TIPS

STEP 4: AUTHORING

Once the video files have been encoded, another software application needs to be used to author and then master the VCD. The authoring process involves compiling the clips into a list of tracks and creating the viewer's interaction on the VCD via interactive menus, events and sequences. VCDs have a specific layout and therefore need to be assembled with an application that can create a valid VCD image.

THE VCD 2.0 STANDARD also provides for DVD-like multilevel interactive menu structures. The various authoring programs provide the VCD editor with a working space in which objects in a title are placed into menus and linked together in an interactive framework. An authoring application should allow for the graphical definition of menus and the ability to associate all objects with the video assets.

THERE ARE A FEW INTERACTIVE VCD authoring applications available that deliver a similar environment to DVD. The best software package at the moment is EasyCD Creator 5.0 Platinum Edition from Roxio (www.roxio.com). The previous version of EasyCD Creator (version 4.0) could also build an interactive VCD, but the creation process was less sophisticated.

USING THE INTERACTIVE VCD wizard, the creation process is relatively easy. The MPEG-1 files are added and linked to buttons on the menu page and play sequences are created that define the order in which the clips will be played.

SOME OF THE AUTHORING SOFTWARE also comes with an MPEG encoder to convert AVI files to MPEG-1 clips, but the quality is much lower than that obtained from a proper MPG encoder. Some software will also re-encode MPEG-1 files that fall outside the VCD specifications.

THE SIMPLEST WAY TO CREATE A VCD is to opt for a Simple Video Sequence that places the video clips one after the other in playing order.

FOR PLAYBACK, the user can jump to the next (or previous) clip by pressing [] (or [V]) on the VCD/DVD player remote control or the onscreen transport control on a PC. Most VCD players will play clips in order with a pause of a second or two in between each clip.

STEP 5: MASTERING

In CD-speak, mastering a VCD is simply burning a CD. Although the fact that it's called the mastering process suggests the ability to create a master disk from which others can be copied, it basically means writing the video files to a blank CD and finalising the session.

THE CD BURNING PROCESS is made relatively simple in all the software packages currently available. It involves assembling all of the MPEG-1 files together using a browser structure and then going through the program's native CD writing process.



▶ Always preview the video files and any menu-based interactivity prior to burning the CD.

If you're working with AVI files before encoding MPEG-1 files, there are some PC configurations that will make the editing process easier:

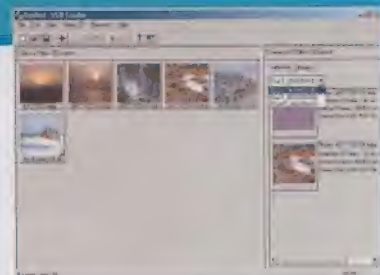
■ **A fast processor** A fast processor can really help, as encoding an AVI file to MPEG-1 in software is processor-dependent. Depending on which MPEG-1 encoder is used, it can take several hours to encode a one-hour AVI. The faster the processor, the better.

■ **RAM** RAM can be important to the capturing and encoding process. 256MB of SDRAM should be the minimum, and 512MB is preferable.

■ **A large hard disk** Use a secondary hard drive that's dedicated to video. This should have a data transfer rate of around 7Mbits/s with a 7,200rpm speed; ensure that the drive has DMA enabled.

■ **A CD writer** Make sure the CD-R/CD-RW is supported by one of the CD writing applications. The faster the CD writer, the faster the VCD will be written to disk.

■ **PCI soundcard** A problem that arises with MPEG-1/VCD video is that you can lose audio and video sync. While this can happen with PCI soundcards, it is more of a problem with ISA-based cards. Choose a PCI soundcard where possible.



▶ A good VCD menu system provides thumbnails of the clips for easy identification and layout.

CD BURNING SOFTWARE:

- Ahead Software Nero 5.5 (www.nero.com)
- VCD Imager (www.gnu.org)
- Roxio Easy CD Creator 5.0 Platinum (www.roxio.com)
- NewTech Infosystems CD-Maker Pro 5.0 (www.nticdmaker.com)
- FireBurner (www.fireburner.com)

Some of these applications are freeware, while others allow a timed use before purchase.

Essentially, once all the other steps are complete, it is easy to create a VCD. You simply:

- Create a new VCD project in the software application;
- Drag and drop VCD-compliant MPEG-1 files to the track window; and
- Click the Record button.

The CD-R media used to burn CDs is also important. With all the VCD projects I've created over the past 12 months, I have used either Verbatim DataLifePlus CD-R or TDK CD-R disks. These are the only CD-R disks that I have found to be 100% reliable, and I have yet to have a VCD fail because of a disk error. ■

Next month: Creating mini-DVDs from DV footage.

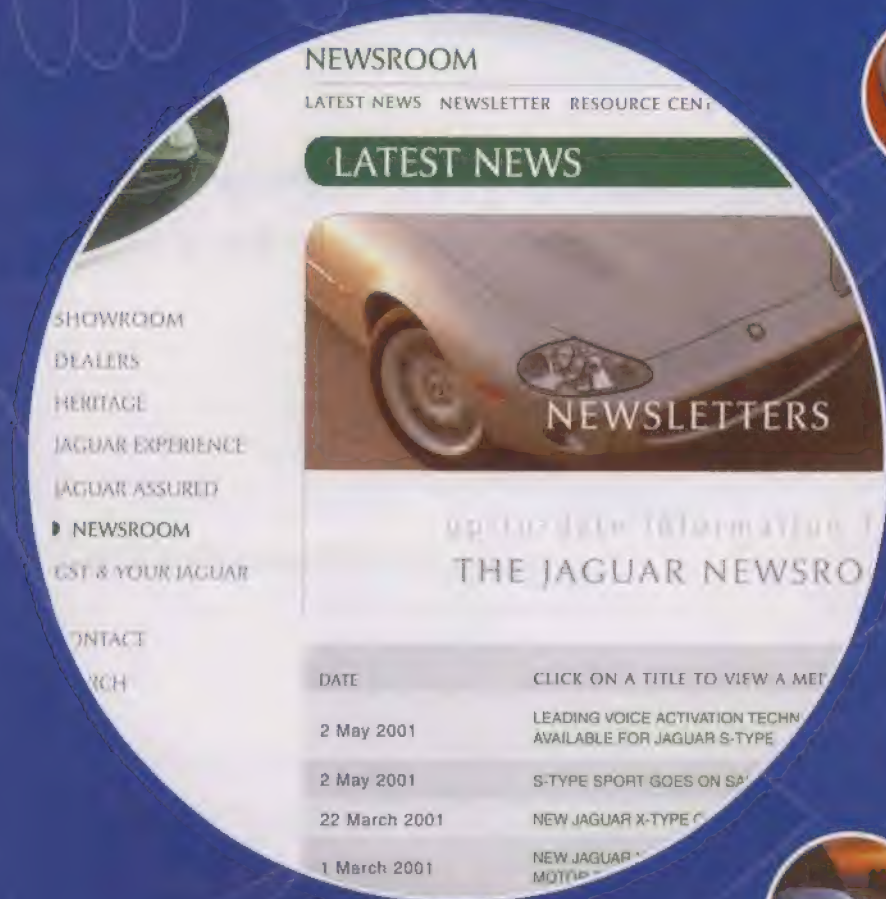
VCD VERSUS S-VCD

	Video CD 2.0	S-VCD
Playing time:	74 minutes	35 to 70 minutes+
Data rate:	150Kbits/s	300Kbits/s
Video:	MPEG-1 1.15Mbits/s	MPEG-2 2.6Mbits/s
Resolution:	352 x 240 (NTSC), 352 x 280 (PAL)	480 x 480 (NTSC), 480 x 576 (PAL)

PETER BLASINA is Australia's foremost expert on digital video and the editor of Videocamera Magazine. He can be contacted at videocamera@vcp.wow.aust.com.

OK

who's behind this?



I knew it ...

ColdFusion.

And who's behind ColdFusion at jaguar.com.au? Justin Flynn and his team at Monde Online, that's who.

Together, they effortlessly deployed an armoury of key business features such as a virtual showroom, response and feedback mechanisms and even a Journalist's Resource Centre where journalists can register and gain access to the latest Jaguar info and images.

Of course, being a ColdFusion site, Monde was able to easily create a customised publishing system which allows non-technical staff at Jaguar to update site content instantly.

See ColdFusion and Jaguar in action at www.macromedia.com/ap/showcase/casestudies/.

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FOLLOW THE SCRIPT

USE FLASH MORE EFFECTIVELY THAN EVER BY BRUSHING UP ON YOUR MATHS AND INTRODUCING SCRIPTS.

You may have wondered how Flash designers build interfaces that animate so smoothly and respond to mouse movement with ease.

The answer is scripting. You can animate just about anything in Flash using key frames and tweens, but there's very little flexibility in it. As the author, you create the animation, which is then fixed until you alter it manually. To account for multiple user input scenarios, you have to create a new tween for every different situation,

which takes a lot of time and patience. What's more, it takes up a lot of space.

By using scripted events and loops, you can mimic the appearance of key framed animations and gain a lot of flexibility (and file economy) in the process. The secret is in translating the movement you would normally animate by hand, and writing it as a mathematical formula — one that the computer can use to move objects dynamically.

TOP FLASH SITES

Panasonic Global is by far one of the best corporate Web sites I've seen. The use of Flash to create "hypermodes" navigation adds a touch of the geographical, giving each section and subheading its own individual space on a large, animated canvas. Human beings are well adapted to

remembering things by their location, so this site looks great and is particularly easy to navigate.

The central technique here is scrolling the main section segments. This is achieved with the use of a simple tweening algorithm, written in ActionScript. Each time a new section is selected, the entire grid scrolls to its new location, displaying the relevant section.

HOW TO MAKE IT

I've recreated a version of this scrolling navigation system for you to customise and extend in your own Flash work. You'll find it on CD 1 of this month's CD set.

The first step in reproducing this effect is to create the viewport or area in which the scrolling elements will be visible. By setting up a Mask layer, I was able to punch out a special "see-through" area by drawing a simple rectangular shape. In the Mask diagram you'll see that the Section Mask and Sections layers have

Flash on the CD

On disc 1 of this month's CD set you'll find some useful Flash utilities:

Accessibility Kit Extension

Features many benefits for users with disabilities, such as magnification, alternate text and customised colour swatches.

Cyber Calculator

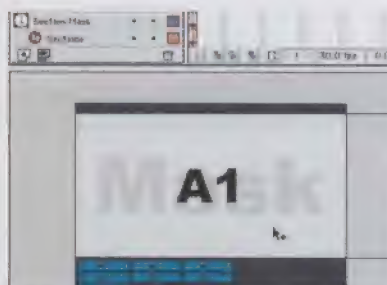
A Flash calculator which passes variables back and forth through different functions, and utilises string concatenation in some segments.

Flash Player

Install Flash Player to play Flash animations in your Internet browser.

WDDX Serializer/Deserializer Extension

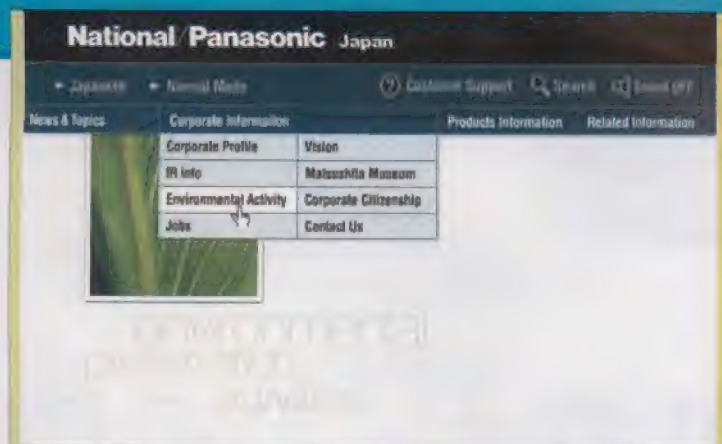
This ActionScript uses the Flash 5 XML object to turn ActionScript objects into generic XML data.



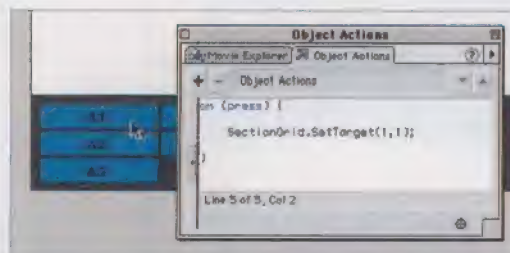
Flash Masking controls what's blocked out, rather than what's visible.

How maths comes in handy

Scrolling is just one example of where maths and scripting can be useful. Getting to know formulas is also useful for creating simulated physics effects such as gravity, and circular and wave-like motions. In fact, most of the coolest Flash work on the Web is driven by formulas rather than manual animation.



► The Panasonic Global Web site is a great example of what can be achieved with Flash scripts.



► The code attached to the script can be viewed in Object Actions.

special icons, indicating that one is a Mask and the other is Masked.

FLASH MASKS

In Flash, masks work in the opposite way to other graphics programs in that they control what's visible rather than what's blocked out. If you lock a Mask layer and its Masked layer at the same time, you'll be able to preview the results of the masking effect. Make sure that you only put one object in your mask layer, otherwise you could get unpredictable results.

Next come the navigation buttons. In Panasonic Global, these are organised in drop-down menus that activate on rollover, but I think this is probably a tad confusing for most site visitors. Instead, I used the lower portion of the movie to lay out buttons that are visible at all times, in a scaled-down representation of the sections themselves. On each of the buttons is some script, for example:

```
on (press) {  
  
    SectionGrid.SetTarget(1,1);  
  
}
```

This script activates the buttons and enables them to call up a particular section. The sections are arranged in rows and columns, so each button has its own set of grid numbers; in this case, Column 1, Row

1. SectionGrid is the name of the scrolling movie clip, and SetTarget is a customised function I created to perform the scrolling.

To examine the code that makes SectionGrid work, unlock the Sections layer on the main Timeline and select it. Then bring up the Object Actions panel and you should see all the code attached to the clip.

The core script is the following two lines, which form part of the Scroll() function:

```
_x = _x + ((TargetX - _x) / 3);  
_y = _y + ((TargetY - _y) / 3);
```

These formulas describe the motion of the grid from one location to another. TargetX and TargetY are variables that describe the location of the newly selected section, and _x and _y describe the current position of the clip. The formula essentially says: "Wherever you are now, discover the difference between that location and your destination, then move one-third closer". The remaining distance gets smaller every time, making the clip appear to decelerate.

To customise your own grid size, start by popping back to the main timeline and editing the first frame of the ActionScript layer. There you'll find two variables being set that describe the number of rows and columns:

```
Columns = 3;  
Rows = 3;
```

Aside from changing these numbers, you need to add the new graphics to SectionGrid. It's a very large clip, dimensionally speaking, and you'll notice that Flash can't scroll all the way over to its edge. I've added a special symbol to the Library named Zoomed Out View, which includes an instance of SectionGrid, but one that's scaled down for convenience. Inside Zoomed Out View, select the grid and Edit In Place, and then you'll be able to add or rearrange sections easily. ■

TIPS

KEEP IT SIMPLE (OR BITMAPMED)

Because all of the sections in the Scrolling Navigation example are 550 x 300 pixels, it's important to optimise each one so that they scroll smoothly. Complicated vector imagery can move quite sluggishly at times, so try to stick with simpler shapes or a bitmapped image like the ones used by Panasonic. I've added code to minimise the number of sections visible at any one time, so in all but the most extreme cases, performance should be good.

PRELOAD WITH LOADMOVIE

Sometimes if your grid is larger than a few sections, the SWF file you export is also pretty bulky. Rather than putting everything into one movie, you can make the section clips blank, like placeholders. Then create a separate 550 x 300 SWF for each section, with a preloader and the content. You can stream in each of the content movies using loadMovie() and specifying the placeholders as Targets.

BE CREATIVE WITH MASKS

In my example I used a rectangular graphic in my mask layer, but you needn't do so. Try using the same technique but with elliptical or irregular section shapes. To adapt the technique for vertical or horizontal motion only, use a single row or column of sections underneath the mask. This creates a totally different effect.

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DON'T EMAIL IT, UPLOAD IT!

AS ACCESS TO THE INTERNET BECOMES MORE WIDESPREAD AND BANDWIDTH BECOMES MORE PLENTIFUL, DOCUMENT LIBRARIES ARE INCREASING IN POPULARITY.

Web-based file storage is far more flexible and reliable than email, and a Web-based interface is preferable to FTP clients for managing files on a server. To provide a Web interface, your Web pages need to be able to handle file uploads using multipart HTML forms.

HTML FORMS AND HTTP UPLOADS

A file upload form, otherwise known as an HTTP upload form, looks much the same as any other HTML form. It can even include "regular" form inputs

such as text fields, radio buttons, selection lists and checkboxes. Below is a simple example of a file upload form, and figure 1 shows how it appears in a browser.

```
<form method="post" action=
"upload.php"
  name="submit" enctype="multipart
/form-data">
  <input type="file" name=
"userfile"><br>
  <input type="submit" value=
"submit"><br>
</form>
```

This form has two distinguishing features. The first is the file input field `<input type=file>`. This produces a combination of what appears to be an ordinary text field and a "browse" button, allowing you to select a file to upload from your computer.

The second feature is the `enctype` parameter of the form tag, which specifies the way the browser should

encode the form data. Unlike most forms, file uploads deal with binary data as well as with text, so the parameter needs to be set to "multipart/form-data".

For anyone who has worked with forms in ASP before, be warned that this encoding type renders the usual `request.form()` collection useless, so the form field values have to be accessed a different way (more on this later). Fortunately for PHP users, the form decoding is handled natively, so you don't have to worry about decoding your form values manually.

THE PHP TECHNIQUE

When a file is successfully uploaded to a PHP script, four environment variables are created that allow you to manage the file data. Assuming you have used the name "userfile" in your file form field, these are:

```
$HTTP_POST_FILES['userfile']['name']
(or $userfile_name)
$HTTP_POST_FILES['userfile']['type']
(or $userfile_type)
$HTTP_POST_FILES['userfile']['size']
(or $userfile_size)
$HTTP_POST_FILES['userfile']['tmp_name']
(or $userfile)
```

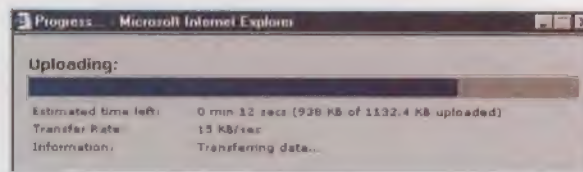
Before you start

Because anything that is submitted in a form needs to be processed by the server, your Web server needs to have a scripting environment installed. This might be Active Server Pages (ASP), PHP, ColdFusion, Java Server Pages (JSP) or Perl (CGI). This month, we are focussing on ASP and PHP, but the techniques are applicable to any scripting engine.

If you are running Windows, you can find out how to set up Personal Web Server with ASP at www.w3schools.com/asp/asp_intro.asp. If you want to try Apache and PHP instead, you can find out how at www.thickbook.com/extra/php_apachephp4_win.phtml.

If you are running Linux, you can find out how to set up the Apache Web server with PHP at blazonry.com/scripting/install_apache.html.

Mac users can learn about setting up Apache and PHP at www.devshed.com/Server_Side/Administration/BuildingOnOSX/



► The ABCUpload component for Windows comes with an HTML progress window as shown here. It keeps visitors informed about how their uploads are progressing.

Admin: Upload File

Client:

Select File:

Select File:

Select File:

Select File:

Select File:

Password:
Leave empty for no password

Email Notify: ☐ Daniel ☐ Peter-paul
☐ Mia ☐ Sean
☐ Michelle ☐ Sarah
☐ Jeremy ☐ Chris
☐ George ☐ Urban
☐ Kate ☐ Matt
☐ Robert ☐ Alex
☐ Richard ☐ Pam
☐ Cassandra
☐ Linley

Description:

► Multiple file uploads can be performed on a single form with other input elements such as text fields and checkboxes. This form also sends an email to specified recipients.

The first of these is the original filename of the uploaded file. The second is the MIME type of the file. For example, if a GIF is uploaded, its type will be 'image/gif'. Next comes the size of the file in bytes, and lastly the temporary filename that PHP used to store the uploaded file. Because PHP automatically deletes the temporary file when the page finishes executing, you need to move it somewhere for use later. The following code demonstrates how to do this.

```
<?php
if (is_uploaded_file($userfile)) {
    copy($userfile, "/place/to/put
/uploaded/file");
} else {
    echo "Possible file upload attack:
filename '$userfile'.";
}
/* ...or... */
move_uploaded_file($userfile,
"/place/to/put/uploaded/file");
?>
```

The `is_uploaded_file()` and `move_uploaded_file()` functions used above were introduced in PHP4 to simplify the handling of file uploads. You can check the size variable to determine whether a file is too large or too small to keep.

THE ASP TECHNIQUE

Unfortunately, things aren't quite as straightforward with ASP pages, but if your Web server is running VBScript version 5, you are in luck. CD 1 of this month's CD set contains code that can be used to handle file uploads easily in ASP. The code utilises a VBScript 5 class that enables you to decode the encoded form data into its original text and binary components. The gist of it is as follows:

```
<!-- #include file="upload.asp" -->
<%
Set Uploader = New FileUploader
Uploader.Upload()
For Each File In Uploader.Files.Items
    File.SaveToDisk
    "E:\UploadedFiles\"
    Response.Write "File Uploaded:
" & File.FileName & "<br>"
    Response.Write "Size: " & File
.FileSize & " bytes<br>"
    Response.Write "Type: " & File
.ContentType & "<br><br>"
Next
%>
```

This code starts by including the `upload.asp` page that contains all the decoding routines. Next, the `FileUploader` class is instantiated, and the page loops through and saves any uploaded files to `E:\UploadedFiles` while writing the file details back to the browser with the `response.write()` function.

If for some reason VBScript 5 is not available, you need to install a third-party COM object to manage your file uploads. One of the best is ABCUpload, available for free from www.websupergoo.com.

Once this object is installed on your server, you have a few extra features available, such as an HTML "Upload Progress Bar" that gives your users a visual indication of how their upload is going. It also natively handles MacBinary for uploads coming

from Macintosh users, making cross-platform file sharing a transparent process. ABCUpload also comes with database insert and retrieval functions so you can store your uploads in a database with ease. ■

TIPS

FILE UPLOADS IN COLDFUSION

One of the benefits of using ColdFusion over languages such as ASP and PHP is that so much functionality is handled natively and wrapped up in easy-to-use tags. File-upload handling is no exception. The HTML form is identical to the one you would use for any other language (except that the action points to a ColdFusion page).

```
<FORM ACTION="upload.cfm" METHOD="post"
ENCTYPE="multipart/form-data">
```

```
File 1: <INPUT TYPE="File" NAME=
```

```
"File1"><BR><INPUT TYPE="Submit">
</FORM>
```

Instead of having to test environment variables, instantiate classes, or install DLL files, all you need to do is use the `<cffile>` tag as shown here:

```
<CFFILE ACTION="UPLOAD"
```

```
DESTINATION="C:\Uploads\"
```

```
FILEFIELD="File1">
```

The action parameter tells the tag that it is dealing with an uploaded file. The destination specifies a location to save the uploaded file, and the file field parameter indicates the name used in the form file field. Multiple files can thus be uploaded and handled with multiple `<cffile>` tags.

FILE UPLOADS IN JAVA SERVER PAGES

With JSP you need to create or install a server component to manage your file uploads. `JspSmartUpload` is a free component available from www.jspsmart.com that allows you to handle uploads in just a few lines of code, as shown here.

```
<%@ page language="java"
```

```
import="com.jspsmart.upload.*"%>
```

```
<jsp:useBean id="mySmartUpload"
scope="page"
class="com.jspsmart.upload.SmartUpload" />
```

```
<% mySmartUpload.initialize(pageContext);
```

```
mySmartUpload.upload();
```

```
mySmartUpload.save("/upload"); %>
```

Multiple files, database inserts and saving to virtual directories are also supported by `JspSmartUpload`. Other JSP upload components are available from coldjava.hypermart.net/servlets/fmanager.htm and coldjava.hypermart.net/servlets/upload.htm

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ACTIONS: AUTOMATING TASKS IN PHOTOSHOP

LEARN HOW TO CREATE ACTIONS IN PHOTOSHOP AND SAVE YOURSELF SOME VALUABLE TIME.

Photoshop has a host of automation tools, and the most versatile and powerful is called an action. In fact, some other automation commands, such as batches and droplets, derive their functionality from actions. An action is like a macro (or script), but while macros can be confusing and difficult to create, actions are not. If you know how to use Photoshop, you know most of what you need to create your own action.

Let's say you have 100 photo CD images that you want to put on the Web. You could load each one, scale it down, colour-correct it, sharpen it, and then save it as a JPEG. On the other

hand, you could write an action to do the dirty work for you while you kick back and relax. And best of all, with an action you will achieve consistent results in far less time than you could ever have done manually. Actions can shave seconds, minutes or even hours off production time.

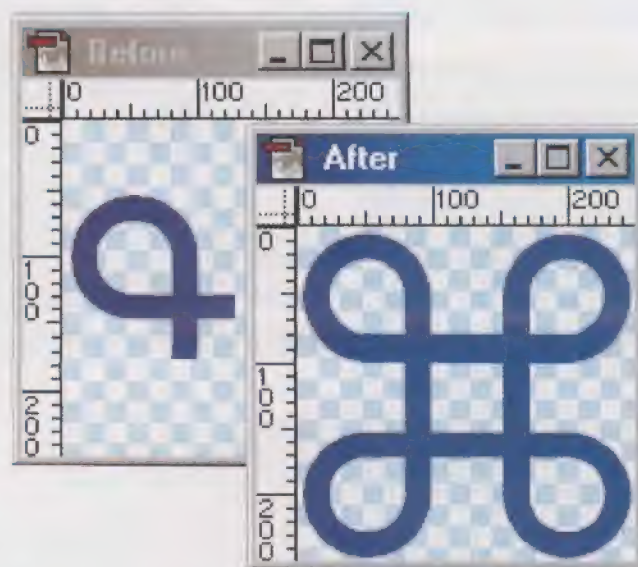
You can write an action to do just about anything, but some common uses include repeating tedious or boring tasks, distributing reproducible special effects (usually for type), and batch processing multiple images — all of which can save you a lot of time.

All right, now to create an action of your very own!

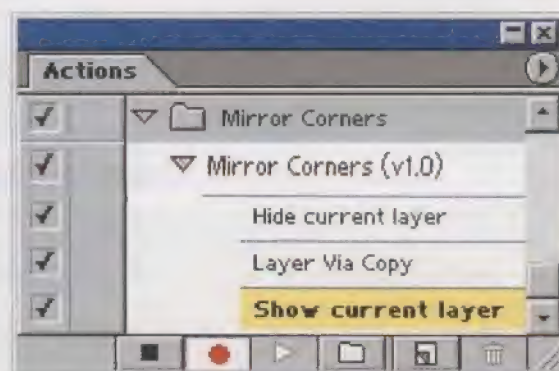
CREATING AN ACTION

For this example, you will create an action that mirrors the active layer across both the vertical and horizontal axes (on a separate layer, to preserve the original) and centres the results on the canvas. This can be useful for symmetrical shapes and repeating patterns. To see what the results of the action will be, look at figure 1.

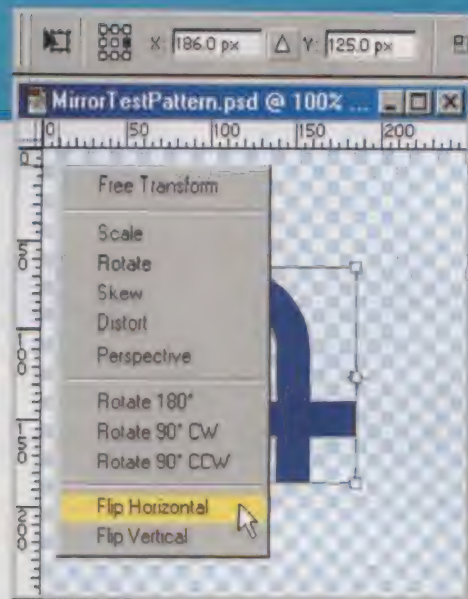
1. You will need a practice image to use while you record and test your action, so either load the file called *MirrorTestPattern.psd* from disc 1 of this month's CD set, or create an image and draw a pattern on a layer of its own.
2. Make sure the Actions palette is visible by pressing F9 (or choose Window and then Show Actions from the menus). Add a new set by pressing the Action Set button (or choose New Set from the Actions palette menu). Name the set "Mirror corners". Add a new action to the



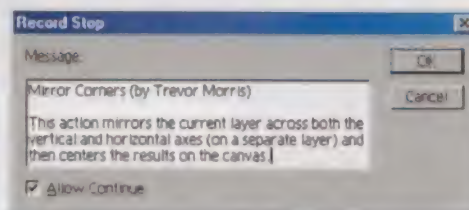
► Figure 1: The results of the action.



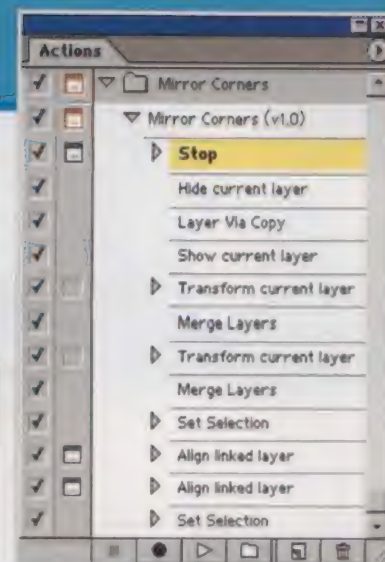
► Figure 2: A "Hide current layer" command has been added to the action.



► Figure 3: Flipping the image horizontally.



► Figure 4: An example of what to put in your Stop message.



► Figure 5: The Stop command has been moved to the top of the action.

set by pressing the Create New Action button. Name the action "Mirror corners (v1.0)", and assign a function key and button mode colour if you like. Finally, begin recording by pressing the Begin Recording button.

3. Because you are going to duplicate the current layer (to preserve the original work), we will hide the layer so that it does not obstruct the view of the final results. Click the Visibility icon associated with the current layer. Note that a command called "Hide current layer" has been added to the action (see figure 2).

4. Next, duplicate the current layer by pressing Ctrl-J (Command-J on a Mac or Layer, New, Layer via Copy in the menus). Turn on the new, duplicated layer by clicking on its Visibility icon. Both commands should appear in the action.

5. Now we'll use the Edit, Transform command to flip a horizontal duplicate of our current layer.
■ Note that holding down the Alt key (Option on a Mac) while choosing Edit, Transform performs a transform on a duplicate of the original selection. This allows you to perform two steps at once.
■ Press Ctrl-Alt-T. In the Options palette, set the Reference Point

location to the right side, then right-click (Control and click for Mac) in the document window and choose Flip Horizontal from the context menu (as in figure 3). Press Enter to accept the transformation.

6. Merge the two halves/layers together by pressing Ctrl-E (Layer, Merge Down).

7. Now let's flip the current layer vertically — which is similar to what we did in step 5. Press Ctrl-Alt-T. In the Options palette, set the Reference Point location to the bottom, then right-click in the document window and choose Flip Vertical. Press Enter.

8. Again, merge the two halves together by pressing Ctrl-E.

9. To centre the pattern we'll use the Layer, Align Linked To Selection commands.
■ Unfortunately, you cannot use the Alignment buttons in the Options palette because their functions will not be recorded.
■ Select the entire canvas by pressing Ctrl-A (Select, All). From the menus, choose Layer, Align To Selection, Vertical Centres, then Layer, Align To Selection, Horizontal Centres. Drop the selection by pressing Ctrl-D (Select, Deselect).

10. Finally, stop recording by pressing the stop button. As a final touch, add a Stop message to let other users know what this action does. Choose Insert Stop from the Actions palette menu. Enter something similar to the message in figure 4 and be sure to select the Continue button.

■ Because you want the message to be displayed at the beginning of the action, drag the Stop command above the "Hide current layer" command in the Actions palette, so that it appears as the first step in the action (see figure 5).

■ If you want the message to be present in the action, but not displayed each time the action is played, simply uncheck the Include box for the Stop command.

Try your new action on different patterns and canvas sizes to make sure it works properly. Once you are happy with the action, save it using the Save Actions command in the Actions palette menu. Save your actions in the Photoshop 6.0\Presets\Photoshop Actions\ folder (or subfolder).

For a great source of free actions, visit Adobe's Action XChange (www.actionxchange.com). As a member of the Action XChange, you can even upload your actions for other users. Membership is free. ■

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THE HAPPY HACKER

HACKING ISN'T ALWAYS A BAD THING. IN FACT, IT'S PROBABLY THE BEST WAY TO CUSTOMISE YOUR PALM HANDHELD AND MAKE IT WORK THE WAY YOU WANT IT TO.

Want to improve the Palm's search feature, make it easier to work with Graffiti, switch back and forth quickly between programs, even overclock your Palm so that it runs faster?

The answer is to hack your Palm! But don't be put off just because I've invoked the H-word. This is all about the original hacking — curious programmers cheekily taking advantage of software "holes" and workarounds to perform clever tricks. It's the best type of hacking because the programmers have done all the work. All you need to do is load the hack programs and enjoy the benefits.

That said, a little background on Palm hacks will help you understand how they work and conduct basic troubleshooting when a hack starts misbehaving.

PALM HACKING 101

A Palm "hack" is a small program that plugs into the foundations of the Palm operating system to solve some niggling irritation, overcome a limitation or add new features to the Palm OS environment. The programs are known as hacks, as they conform to a standard format and file type. You can also think of them as add-ins, plug-ins or system extensions.

Palm hacks work in a two-step process. First, a hack identifies a

special aspect of the OS programming called a "trap" which describes a unique action such as when you press a particular hardware button or draw a certain pen stroke. For example, there's a single trap that instructs the OS to launch the To Do applet. This trap is invoked when you tap the To Do button on the Palm or select the To Do program from the main menu.

Traps can also be called by other programs, for example, an "agenda" applet which displays your daily appointments and "due today" to-do items on a startup screen can also be used to launch the full To Do list. Other traps can be used to display the onscreen keyboard, sound an alarm or turn the backlight on or off.

Having identified and hitched itself to a particular trap, a hack then intercepts all calls to the trap and runs a small "patch" program. It's the software equivalent of a detour sign which says "Don't go that way, take this route instead".

There are about 1,000 traps built into the Palm OS, offering plenty of ways to reshape the OS, and there are also hundreds of hacks available.

HACK MANAGERS

Hacks are installed like other Palm programs, using the Palm Install Tool to pipe them from your PC to your

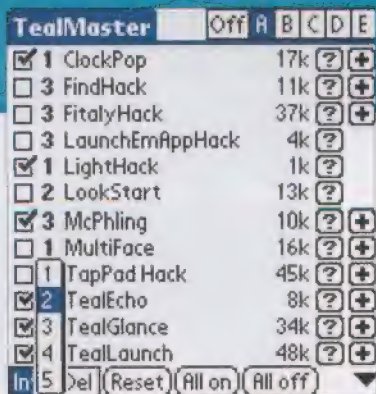
Palm during HotSync. However, unlike standard programs, they don't appear on the Palm's menu screen — they weave themselves directly into the OS.

Before you load a hack you need to install a small utility known as a hack manager. This provides a control panel in which you can activate and customise each hack.

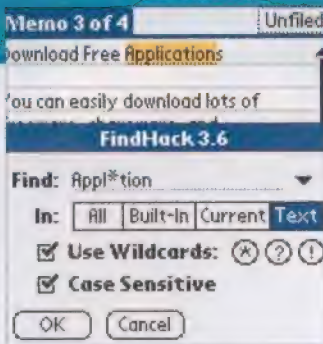
The oldest and still most popular hack manager is Edward Keyes' HackMaster. HackMaster was intended to provide programmers with a uniform way to write hacks and hook them into the Palm OS, as well as acting as a traffic cop for hacks attempting to access the same trap. HackMaster also provides a simple interface for working with hacks, and graceful recovery from crashes (which occur less frequently than they used to) when you're mucking about with the OS.

All hacks installed on your Palm appear as a list in HackMaster. Mark the checkbox against a hack's name to activate it, then tap the box a second time to disable the hack. Most hacks display two icons alongside their name. The first is a question mark which provides anything from basic instructions on using the hack to the obligatory "About" screen information. The second is a + symbol for modifying the hack's options and setting your preferences. However, many hacks are so straightforward that they don't need the + icon.

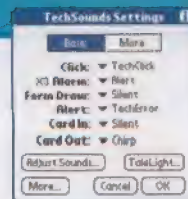
Keyes developed and published the hack protocol, wrote a few cool hacks of his own, then made HackMaster available to the Palm community as a



► *TealMaster provides a superior degree of reporting on and analysing of your hacks.*



► *Findhack searches your Palm faster and more efficiently than the inbuilt search.*



► *Customise your Palm with Techsounds.*

A HANDFUL OF HACKS

AFTERBURNER: Put some pep into your Palm with this neat overclocking tool. Choose between turbocharging for apps that need speed, and slowing the processor to extend battery life when using less demanding apps.

CLIPHACK: Expand the Palm's clipboard limit from a miserly 1KB to a solid 32KB. Especially useful if you want to cut and paste from memo items, which at a maximum 4KB size are often larger than the default clipboard allows.

FINDHACK: Go a step better than the Palm's built-in finder with a more powerful and flexible search routine.

GLOWHACK: Automatically activate your Palm's backlight when you turn the Palm on between predefined hours (say, 9pm and 6am).

LEFTHACK: This southpaw-friendly hack shifts the scrollbars to the left side of the screen so they don't get in the way when you're writing.

MENUHACK: Tap an applet's title bar to reveal its drop-down menus. This feature was rolled into Palm OS 3.5, but MenuHack is a must-have if you're running an earlier version of the OS.

SELECTHACK: Double-tap a word on your Palm (in the To Do list or Notepad, for instance) to select it; three times to select the entire paragraph.

SWITCHHACK: Jump between your current and previous app without going via the main applications menu screen, or summon a list of your 10 most recently used programs, with a stroke of the pen.

SYMBOLHACK: Provides a pop-up window of fractions, brackets, currency, mathematical symbols and more so you can tap the symbol rather than memorise clumsy Graffiti strokes.

TEALGLANCE: Provides a consolidated view of your DateBook and To Do List entries, which can be set as the startup screen when you turn on your Palm.

TECHSOUNDS: Okay, this update to TrekSounds isn't exactly essential, but it lets you change the boring Palm system alert and alarm sounds into a variety of snazzy sounds including recognisable effects for everything from Star Trek to Austin Powers.

fully-functional program for a modest US\$5 registration fee. What a guy!

Unfortunately, HackMaster never made it past version 0.9, which is still available at Keyes' DaggerWare Web site (www.daggerware.com) and other sites such as PalmGear (www.palmgear.com). It's a testament to Keyes' skill that HackMaster still runs so well with so many hacks and so many major updates to the Palm OS.

However, several other hack managers are worth trying. X-Master is a free manager from LinkeSoft (www.linkeisoft.com), and TealMaster is a US\$10 shareware program created by well-known Palm programming house TealPoint (www.tealpoint.com).

Both are touted as 100% compatible with HackMaster's de facto hack standard, so they should run all current hacks. They also offer an improved interface, greater stability, more control over hacks and better conflict handling. They let you create and manipulate sets of hacks, so you can run a group of hacks depending on the occasion, and they add an automatic confirmation to reinstall hacks after a soft reset of the Palm.

I consider X-Master best for most Palmists, not least because it is free; but power users could try TealMaster for its superior degree of reporting and analysing, which assists in hack troubleshooting. Also, its ability to set hack running order helps you juggle calls made to the same trap, and minimises conflicts in the first instance.

So that you can try them both (one at a time, of course!) we've included X-Master and TealMaster on

this month's APC CD set, along with the original HackMaster and our own hand-picked selection of the best hacks.

WHEN HACKS ATTACK

Hacks hook themselves into the OS at a very deep level, and along with hack managers, they can have difficulties working on certain handhelds and Palm OS versions. A misbehaving hack will most likely result in a system crash and a soft reset. You won't lose any of your work, but you'll need to sort out the problem so it won't happen again.

First, browse the hack's readme file or other documentation. Some hacks only work on a certain version of the OS (you can check your OS by going to the main applications menu screen and choosing Options, About Applications). Some also have problems coexisting with other hacks, usually if they perform a similar task or share the same trap.

Next, disable all other hacks in your hack manager and see if the problematic hack works properly on its own. If so, the problem may well stem from conflict between hacks. Reactivate one of the other hacks, then see if the troublesome hack still runs as it should. Enable the other hacks one at a time, until you find the conflicting one.

Overclocking is a common cause of instability in Palms, producing a series of hack crashes. You might need to wind the wick back a little, or turn off the overclocking utility completely.

If you decide to give a hack the flick, deactivate it before deleting it. This is usually a two-step process: disable the hack in your chosen hack manager, then remove it using the App>Delete command from the Palm's main menu. Likewise, disable a hack before you attempt to install a later version of it. ■

DAVID FLYNN bought his first handheld, an original Pilot 1000, in 1996. He's since owned several devices for the Palm and Pocket PC platforms and is one of Australia's most handheld-savvy journalists.



GETTING YOUR WORD'S WORTH

POWER UP WORD 2002 WITH THESE TIPS FROM THE TRENCHES.

THEY'RE FAST AND EFFICIENT, AND THEY CAN EVEN BE FUN.

THE RIGHT SIDE OF THE TRACKS

Word's Track Changes feature is a great way to work collaboratively on a document. It can also be used to flag shortcuts you've taken while making global edits, such as when you've used Find and Replace.

For example, there is no consistent way to convert I.B.M. into IBM automatically without also removing the full stop from any sentence that ends with I.B.M. However, you can use Track Changes to flag the replacements, making it easier to

check for each instance as you proceed through the document. Just select Tools and Track Changes, use Find and Replace to make the change, and then turn Track Changes off. You'll see every instance of the change flagged throughout the document.

When you reach an instance where the change shouldn't have occurred, swipe your mouse across both the addition and the deletion and click the Reject button in Word's toolbar. Once you've completed the review, accept all the remaining changes and

then perform one more global Find and Replace, this time replacing all instances of I.B.M. with IBM. (including the full stop).

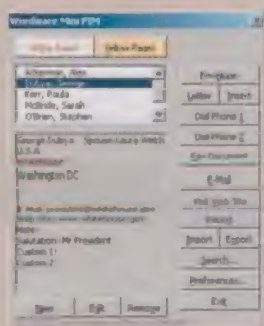
UNTANGLING THE TASKBAR

To the chagrin of many users, Word insists on putting a new entry of itself in the taskbar each time you create or open a new document. While Word 2000 didn't give users a choice, the people at Redmond have heeded the call and provided an option in Word 2002 that clears the clutter once and for all, so you can just have a single entry in the taskbar. You can make the change by selecting Tools, Options, View. Uncheck "Windows in Taskbar" and just use the Window

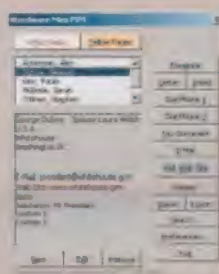
Where there's a Wordware

With a few smart add-ons, Word can do a great deal more than just pump out words. After searching high and low, I've found the Swiss Army Knife of Word add-ons. Wordware from AMF Software provides 18 utilities to help round out Word's feature set in some unusual ways. We'll ignore the more curious — a CD player that operates from within Word probably isn't too high on anyone's list of priorities — but there are others that will give your productivity a significant boost. This is my favourite.

The Wordware Mini PIM is an alternative to the Outlook Smart Tag. Word's standard Smart Tag links with Outlook to copy address information from your contact database, making it easy to draw a contact's address into Word. You can turn it on by selecting Tools, AutoCorrect Options, Smart Tags, and the first item in the list: Person names (English).



The Wordware menu



Wordware loads in a second and integrates perfectly with Word.

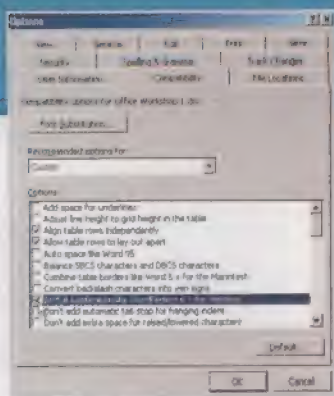
There are, however, some problems. Selecting Insert Address from the Smart Tag icon will only copy an address from the root contacts folder — if you have sub-folders Word will bring up an error. Plus, for reasons I can't quite fathom, the system can't copy a company name. Neither does Word recognise every name as a potential Outlook entry. (Create an entry for River Phoenix to see what I mean.)

There are alternatives to this not-so-smart Smart Tag: If you use the Goldmine contact management system you can install a Smart Tag that links to the Goldmine database and allows the full flow of contact information both from Word to Goldmine and vice versa (see www.goldmine.com/smarttag).

Most other contact management systems provide far more integrated access to Word than the Outlook Smart Tag, but the Wordware Mini PIM does so in a very efficient way. It's a simple name and address database that operates on top of Word. Import records to make it easy to fill the current document with a far more complete set of data.

Once it's in there, it's very easy to insert an address into the current document, overprint an envelope, fax the current document, write emails and dial the phone. It isn't smart enough to match currently selected text to entries in its list, but I find it a solid timesaver.

You can download an evaluation version from www.amfsoftware.com.



- Select this setting to improve Word's justification.

menu to switch between multiple open documents.

IT'S THE WORD THAT COUNTS

If you typically write a fixed number of words and rely on the word count tool, you probably find yourself constantly bouncing up to the Tools menu to get the latest tally. The new Word Count toolbar provides a simple solution. Just select Tools, Word Count and then click the Show Toolbar button. It starts as a floating palette, but you can drag and dock the toolbar with any edge of the

Feature fest

At APC we give Word 2002 a solid workout every day of the week. Here are the top five features we can't live without.

Nonadjacent text selections: Previous versions of Word have only allowed the selection of a single block of text at a time, but hold down the Ctrl key in Word 2002 while you swipe with the mouse and you'll be able to select multiple blocks of nonadjacent text all at once.

Styles and formatting task pane:

The Styles and Formatting task pane reveals all the formatting applied to the current document, making it easy to apply both paragraph and character styles to any text. If you have a lengthy list of unused styles in the current document, you can simplify it by selecting "Formatting in use" from the menu at the bottom of the pane. You can also just click "No formatting".

Multi-clip clipboard: While Office has boasted a clipboard that can store multiple clips for a while, the new clipboard Task Pane makes it easy for us to slash and burn our way through our manuscripts. It brings click and drop to cut and paste.

Balloon comments: Perfect for collaboration, comments now stand out on the edge of the page, rather than being hidden inside a collapsed Post-It note. They're easier to read and harder to ignore.

The death of Clippy: Okay, we can live without this one. Clippy's not dead, just forgotten, but it's great to see the end of a distraction.

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- Word's standard justification can introduce unbalanced white space.

screen. Then either click the Recount button or press Alt-C to display the current word count immediately. Need more than a word count? Click the small arrow to view the other statistics.

FIND AND FORMAT

There are times when you'll need to change the format of a particular word or phrase that occurs more than once in document, such as italicising the name of a book. You could delve into the multiple-layered Find and Replace formatting options, but there's an easier way. Select Edit, Find (or press Ctrl-F). Type in the word or phrase, select the option "Highlight all items found in" and then click Find All. Word will dutifully select each instance. Now you can use the formatting toolbar at the top of the screen to change the formatting of each occurrence with a single button-click. Word keeps the text highlighted throughout, so you can also experiment with multiple formatting options on an ad hoc basis.

IS IT JUSTIFIABLE?

Word 2002 uses a very simple justification method to provide a neat right edge to fully justified text: it adds an equal amount of space between each word. When the edge of a word hits the margin, Word calls it quits and moves on to the next line.

The results aren't always great, especially when setting a multi-column document. Other programs add and remove space to ensure there are never any large, ugly gaps in the text. This balances the amount of white space throughout the document, and is a lot easier on the eyes.

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- Turn on the WordPerfect option to even things up.

Word can do a better job of its justification, but this ability is switched off by default. To turn it on, select Tools, Options and then tick "Do full justification like WordPerfect 6.x".

THE FILTER EFFECT

If you convert Word documents to HTML for display on the Web, consider changing to Filtered HTML. You'll boost the speed of the pages and keep the browsers happy. When exporting to Filtered HTML, Word removes all the extraneous HTML tagging from the source code.

For example, it cuts paragraph style definitions that are not actually used in the current document, even if they're in the style list. A filtered document still displays correctly, but you should see a dramatic decrease in its size.

To save your document as filtered HTML, select File, Save As, open the "Save as type" list and select "Web Page, Filtered".

TAKE A TOUR OF THE GALLERY

Need to create a great-looking document pronto? No problem: just drop the standard Word templates. Under Word's Help menu there's a link for Office on the Web. This should take you to the Assistance Centre on the Office Update site. Click on the Template Gallery link in the panel on the left-hand side and choose from any of the categories of templates provided. If you just want to jump there directly, type the following address into your browser:

officeupdate.microsoft.com/templategallery. ■

STEPHEN O'BRIEN is the author of some two-dozen computing books. He's worn the letters off several keyboards, and suspects he puts more hours into Word than he does into breathing. Between pages he has been known to check his email at sobrien@quorum.com.au.

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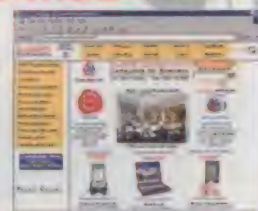
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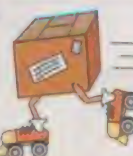


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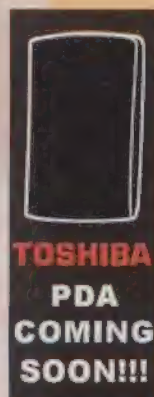
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56k v9.0	Yes	Yes	Yes
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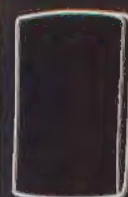
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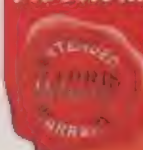
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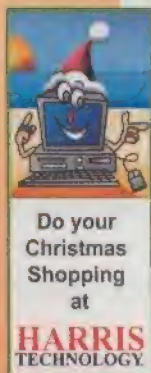
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Evo Notebook N200

Armada 110 Model



Do your
Christmas
Shopping
at

**HARRIS
TECHNOLOGY**

(D1657) GST Inc:

\$3,995

Rent* \$37.33/wk



(D4226) GST Inc:

\$2,295

Rent* \$22.50/wk



The Evo Notebook N200 offers extreme mobility and is feature rich. It is the lightest mini-notebook with all-day battery life.

- Only 1.13kg light and under 1 inch thin
- Mobile Intel Pentium III 700MHz Processor
- 10.4" Colour TFT XGA display
- 192MB SDRAM
- 20GB Hard Disk Drive
- Integrated Modem and 10/100 Ethernet
- Microsoft Windows 2000
- 1 Year Limited International Warranty.

The Armada 110 all-in-one notebook is designed for growing businesses and offers exceptional value-for-money, without sacrificing performance.

- Intel Celeron 850MHz Processor
- 12.1" Colour CTFT 800x600 Display
- 64MB SDRAM
- 10GB Hard Disk Drive
- 24X CD-ROM Drive
- 3.5" 1.44MB Diskette Drive
- Integrated Mini PCI 56K Modem and 10/100 Ethernet
- Microsoft Windows 98/Me Dual Install
- 1 Year Limited International Warranty, including pick-up in Australia
- Includes pick-up from anywhere within Australia, with a 48-hour service workshop turnaround repair time.

RENTSMART

SEE PAGE

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FOR MORE
DETAILS

The figures quoted
are based on a per
week basis over 3
years. T.A.P. Terms
& Conditions apply.

Compaq Internet Connection Sharing

Why would anyone want to network? It's simple, networking allows you to share resources and provide access anywhere you want. Multiple PCs and notebooks can use one printer, and get to the Internet using one Connection. It's easy as 1...2...3.

- Step 1 - Plug in the SOHO Gateway
- Step 2 - Add your network cards
- Step 3 - Start using your network

The Compaq SOHO Gateway is the fastest path to the Internet saving you time and money. Internet Connection Sharing with no need for multiple phone lines. Everyone gets online because it is a single point access for many users.



Compaq Wireless LAN WL310 SOHO Gateway

The Compaq WL310 - is a high-speed -gateway which provides wireless connectivity to Internet service providers, and enables sharing of various computer peripherals from anywhere within the home or small office.

(C3297) GST Inc:

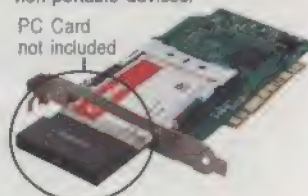
\$743

Rent* \$8.04/wk

Compaq Wireless LAN WL210 PCI Card Adapter

The Compaq WL210 is designed to extend your wireless network to desktops and other non-portable devices.

PC Card
not included



(C3295) GST Inc:

\$374

Save on
COMPAQ
server
bundles
refer to
website
link below
compaq.com.au/solutions/smallmedium

SPECIAL OFFER

Now Compaq makes it even more affordable, with a special offer valid until the end of 31st December 2001. Buy a Compaq SOHO gateway and a PCI Adapter get a free PC Card. Valued at \$295.00 Please quote Part number D4521 when ordering, to take advantage of this promotion.

DEC

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Business Servers For Any Budget

New Generation Compaq ProLiant Servers: In A Class Of Their Own!

ProLiant ML 330e

Best Value Server For A Business!

- Delivers easy-to-manage file, print & Internet sharing
- Intel Pentium III 1000MHz processor with 133MHz front side bus
- 64MB ECC SD RAM (expandable to 2GB)
- 6 Available PCI Expansion Slots
- 20GB ATA/100 Hard Drive (expandable to 160GB)
- Include: Famous Insight Manager Software and SmartStart software suites
- Pre-failure warranty on Hard drives, processor and memory
- 3 Years Compaq Warranty on parts, 1 year on labour & on site (ask about our upgrades)

(D4229) GST Inc:

\$1,949

Rent* \$21.36/wk



ProLiant ML 330 Second Generation

The affordable Server for an Expanding Business!

- Delivers performance and data security at the best price.
- Ideal use with File/Print/Internet sharing, email & Small databases
- Dual processor capable Intel Pentium III 1133MHz with 133 MHz front side bus
- 128MB ECC SDRAM (expandable to 4GB)
- 5 Available PCI expansion slots (includes 4 x 64 bit PCI slots)
- Embedded Dual-channel Ultra ATA-100 with Integrated ATA RAID (ATA models) or Integrated, dual-channel Ultra3 SCSI (SCSI models)
- Tower to Rack conversion option kit available
- Includes Famous Insight Manager and SmartStart Software suites
- Pre-failure warranty on Hard drives, processor and memory
- 1 year Compaq warranty, parts, labour, on site (ask about our upgrades)

(D1753) GST Inc:

\$2,495

Rent* \$24.47/wk

ProLiant ML350 Second Generation

The Workgroup server that will grow with your business!

- Delivers constant uptime and expandability for future growth.
- Ideal use with corporate workgroups and growing businesses that demand expandable, easy to own, rack and tower solutions
- Dual Processor capable Intel Pentium III 1133MHz with 133 MHz front side bus and 512K on-die cache
- 128MB ECC SDRAM (expandable to 4GB)
- 6 Available PCI expansion slots (includes 5 x 64 bit PCI slots)
- Integrated dual-channel Ultra3 SCSI
- 6x 1" Hot-plug Hard drive bays
- Redundant Power supply optional
- Tower to Rack conversion option kit available
- Includes Famous Insight Manager and SmartStart Software suites
- Pre-failure warranty on Hard-Drive, Processors and Memory
- 3 Year Compaq Warranty, parts, labour, on site

(D1754) GST Inc:

\$4,195

Rent* \$39.20/wk



ProLiant ML 370 Second Generation

For unprecedented performance and availability!

When it comes to performance, availability and versatility, the new Compaq ProLiant ML370 G2 server redefines the two-way server class!

- Ensures constant uptime with Hot pluggable Hard drives, cooling fans, PCI slots (2), and also optional Hot Plug secondary power supply. The all-new Compaq online spare memory
- Dual Capable Pentium III 1266MHz Flip Chip PGA system with 512k on die cache and 133MHz FSB
- 256MB of 133MHz ECC registered SDRAM memory (expandable to 6GB)
- Integrated Dual Channel Ultra 3 SCSI Controller
- 6- 1" Hot PLug Hard drive bays, 6 - 64bit PCI slots

Includes:

- New Compaq Smartstart Version 5.1 and Compaq Insight Manager Software
- Pre-failure warranty on Hard drives, processor and memory
- 3 Year Compaq Warranty, parts, labour, on site

(D4042) GST Inc:

\$5,669

Rent* \$51.67/wk



COMPAQ Carepaq Services:

Installation
Carepaq's for:

- Server
- Printer
- Software Setup

Software Support Carepaq:

OS & Application
Telephone
Support
(10hrs x 5days)
5 Call Pack
(C5962)

GST Inc:

\$1,045

Carepaq warranty upgrades available

• Same day on
site • 24 x7 on
site call for
details

Business Work Group Server

\$100 Cashback
on Compaq
UPS* backup
power supply!

Please see
website:

www.compaq.com.au/
promotions/
upscashback
*Applies to all
Compaq UPS
except Pro 500.
Offer Valid 1/11/
01 to 31/01/02.

Corporate Class Server

Manage your
server from
anywhere,
with
Compaq's
Remote

Insight Board
- LOE only
(A0392) GST Inc:

\$999

Only when
purchased with
C1542, D1753,
D1754 or C7879
during Nov 2001

hp omnibook XE3L & 500 Series

Whether you run your own business or work for a large enterprise, you need a notebook PC that helps you stay on top of it all. That's why hp created the **Omnibook XE3L** — a convenient, reliable notebook that comes with everything you need to do business and have a little fun, too. Top performance, Internet working, multimedia, and instant access to your favourite applications.

Omnibook 500 — fast networking computer all in one reliable package with versatility, 1.6kg carry weight and an expansion base with dual multibay capability.

Ask About...



Extend to a total of 3 Years Return to Base

Extend to a total of 5 Years Return to Base

Upgrade Return to Base of Warranty Extension to On-Site



Great gift idea's!

hp omnibook XE3L Celeron

hp OmniBook XE3L Celeron 850 13.3" TFT 128MB, 10GB 24x, 56k/LAN NiMH

- Intel® Celeron 850MHz
- 64MB RAM
- 13.3-inch XGA TFT
- 10 GB
- 24X CD, S3 Savage/IX-8MB
- Built-in 56K modem
- Built-in 10/100 LAN
- Win 98SE/2000.
- 1-year warranty.

Superb performance and value

a great deal!



F3875W

Windows 98 Second Edition

(D1651) GST INC

\$2,658

Rent* \$26.06/wk

F3875K

Windows 2000

(D1652) GST INC

\$2,833

Rent* \$27.78/wk

with CD-ROM

Celeron 850Mhz **13.3 display**

hp omnibook 500 PIII

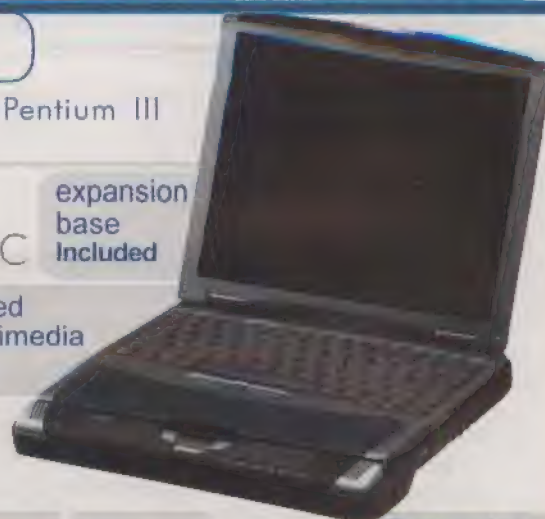
hp Omnibook 500 notebook with Intel Pentium III 700MHz processor

- 128MB RAM
- 20GB HDD
- 12.1" XGA TFT display
- 16-bit Soundblaster Pro compatible sound
- Built-in 56Kbps modem, 10/100 lan and 802.11b wireless networking
- Expansion Base has 2 module bays (1.44MB diskette drive module included)
- Warranty : 1 year return to HP

Ultra Light notebook PC

expansion base Included

omnibook depicted with docked multimedia expansion base



F3481W

Windows 98 Second Edition

(D0211)

GST INC **\$5,390**

Rent* \$49.13/wk

F3481K

Windows 2000

(D0210)

GST INC **\$5,590**

Rent* \$50.95/wk

very light Pentium III 1.6kg 700Mhz

Expansion base Included

base Included

Web Direct

See Web Direct Link (at top of page) for more products and latest info!

DEC

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**RENTSMART**

The figures quoted are based on a per week basis over 3 years. T.A.P. Terms & Conditions apply.

Prices are subject to change. Check here for latest prices & products!!

Web Direct

www.ht.com.au/cat/hp

hp networks & servers

NEXT BUSINESS DAY ADVANCE REPLACEMENT - LIFETIME WARRANTY
PLEASE NOTE THAT PRICES ARE SUBJECT TO CHANGE ON ALL PRODUCTS

hp procurve switch 2512 & 2524

9.6GBPS BACKPLANE & AUTO-MDIX • Lowest Price 10/100 Managed Switch • Provides a rich, layer 2 feature set • Includes 2 transceiver slots for upgrade to a gigabit • Auto MDIX on all 10/100 and 100/1000 ports • Lifetime warranty for as long as you own the product • Wire-speed performance on all ports • FREE HP TopTools Management Software included.



procurve switch 2512 (12 port managed switch) **procurve switch 2524** (24 port managed switch)

(A9703) GST Inc. **\$1,609** (B0062) GST Inc. **\$2,015**

hp procurve switch 2312 & 2324

Ideal for low-cost, unmanaged 10/100 connectivity • Lowest Price 10/100 Switch • Includes 2 Built-in Gigabit transceiver slots • Brings 10/100/1000 solutions to the market • Media-flexible ports for uplinks and server connections • HP quality, functionality and performance • Plug and play solution



procurve switch 2312 (12 port managed switch) **procurve switch 2324** (24 port managed switch)

(B0063) GST Inc. **\$979** (B0064) GST Inc. **\$1,389**

NEW PRODUCT

hp procurve switch modules

hp procurve switch 2124 Transceiver (D1512) GST Inc. **\$1,135**

hp procurve switch 2424M Gig Stack Kit (78306) GST Inc. **\$426**

hp procurve Gigabit-SX Transceiver (82140) GST Inc. **\$783**

hp procurve Gigabit-LX Transceiver (82141) GST Inc. **\$2,115**

hp proCurve 100/1000-T Transceiver (A9127) GST Inc. **\$925**

hp proCurve 100-FX SC Transceiver (A9128) GST Inc. **\$715**

hp procurve switch 4108GL

The hp procurve switch 4108GL bundle is a high performance, Layer 2 modular switch, for high port-density needs at the edge of the network. The chassis bundle provides 72 half/full duplex, 10/100 autosensing ports, with hp auto MDIX, transceiver module for uplinks and 4 free module slots. In addition, the switch offers built-in management (including SNMP and RMON) and fast path technology for wire-speed switching.



(C5871) GST Inc.

\$17,495

Rent* \$141.30/wk

NEW PRODUCT

hp netserver e800 PIII -1000

The easy server your business can depend on

The hp netserver e 800 is a perfect fit for small to medium-sized businesses that operate with little or no in-house IT support.

Features

- Intel Pentium III 1000MHz
- 128MB SDRAM
- 256KB L2 cache
- 40x CD-ROM
- no HDD, FDD (flexibility in choosing your hard drive, by the size of your business)
- dual-channel Ultra2 SCSI controller
- Embedded ATI XL Video controller (4MB)
- 10/100TX LAN
- 7 shelves, 7 PCI slots (5 32-bit & 2 64-bit), Navigator CD & TopTools
- Warranty : 3 Years, On-Site Next Day

(D1549) GST Inc. **\$3,295**

Rent* \$32.31/wk Call for long term *rental pricing

NEW PRODUCT

NEW



HP ProCurve Switch 408

Unmanaged 8 port 10/100 switch in a compact sized package. This switch offers half/full duplex, 10/100 autosensing on every port. Warranty: Lifetime, Exchange Next Day (C9017) GST INC. **\$405**

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SEE PAGE

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FOR MORE DETAILS

The figures quoted are based on a per week basis over 3 years. T.A.P. Terms & Conditions apply.

All systems include: 7 mass storage shelves (4 available after floppy, CD-ROM & 30GB disc), 5 expansion slots (4 PCI, 1 ISA combination), integrated 10/100 network interface, and easy set up CD.

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PRICING AND SPECIFICATIONS MAY CHANGE. PLEASE REFER TO PAGE 2 FOR DETAILS.

Sales: 1300 13 9999

Fax: 1300 13 6666

Web: www.ht.com.au

Email: sales@ht.com.au

HARRIS TECHNOLOGY Technology Centre
at Kmart Broadway-Sydney

hp pocket pc

hp jornada 560 series

one of the lightest pocket PC's on the market

technical specifications	hp jornada 560 series Pocket PC
processor	206 MHz 32bit Intel(R) SA-1110
display	3.5 inch 16 bit colour TFT LCD with 65K Colours
user interface	pen-and-touch interface handwriting recognition software
power	14 Hour Continuous use removable Lithium - Polymer battery, and coin Battery back up
input / output	serial port, AC input jack, stereo head phone jack
sound	audio speaker and microphone, voice recorder
dimensions	132 x 76.5 x 17.2 mm
weight	173g

F1865A

hp jornada 565

32 MB flash ROM

(D0845) GST Inc: **\$1,175**

Rent* \$12.87/wk

F2915A

hp jornada 568

64 MB flash ROM

(D0857) GST Inc: **\$1,375**

Rent* \$15.07/wk



NEW

Ask About...



- ☐ Extend to a total of 3 Years Return to Base
- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site



Prices are subject to change. Check here for latest prices & products!!

Handheld Computers

Accessories

Palm™ m100 series Leather slim case



(A7222) GST Inc: **\$59**

Palm™ M500/5 Slim Leather Case

(C5069) GST Inc: **\$59**

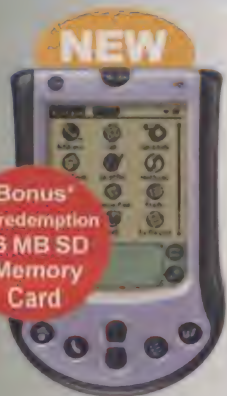
Palm™ 16MB Expansion Card



expand your memory on your handheld.

(C4895) GST Inc: **\$119**

Palm™ m125



Bonus* by redemption 16 MB SD Memory Card

(D0875) GST Inc:

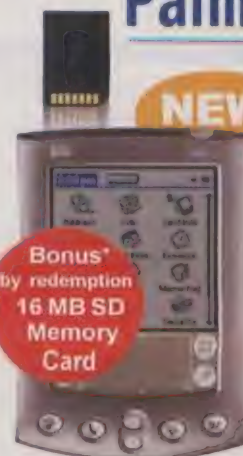
\$565

Expandable connectable

specifications

Weight	151g
HotSync Cradle	Included
Display	Backlight LCD
Infrared Port	Yes
MultimediaCard	Yes
Expansion Slot	
Operating System	PalmOS Software v4.0
Import Export formats	CSV,Tab delimited, TXT,vCard andvCal
System requirements	95/ 98/2000/Me

Palm™ m505



Bonus* by redemption 16 MB SD Memory Card

(C1991) GST Inc:

\$965

Expandable internet-capable and in Colour

specifications

Weight	139g
HotSync cradle	USB cradle
Display	16bit colour
Infrared port	Yes
MultimediaCard	Yes
Expansion Slot	
Operating System	PalmOS Software v4.0
Import export formats	CSV,Tab delimited, TXT,vCard andvCal
System requirements	98/2000/Me

On Redemption*

To apply for BONUS memory card cut out the barcode on the product box and sending it with original receipt and details. All applicants can also entered into a prize Draw. Promotion: full terms and conditions : www.palm.com.au
Mail to: Palm Sales Australia, PO Box 348, Artarmon, NSW 1570.

Iplex- Largest Australian PC maker!



With more than 18 successful years in the IT industry, Iplex is ranked in the top 20 IT companies and top 5 Desktop/Server manufacturers in Australia. Iplex offer systems to best suit your computing needs at a cost effective price.

The Iplex M3 Series Slim Office Desktop is ideal for business and corporate environments. Housed in a small form factor Slim Office Case and featuring Integrated LAN, Graphics and Audio onboard, this is the cost effective business PC. ****NOTE: Monitor not included.**

IPEX M3 SERIES DESKTOP

Form Factor	Slim Office	Slim Office
Processor	Intel® Celeron™ 900 MHz	Intel® Celeron™ 1 GHz
HDD	20 GB	20 GB
RAM	128 MB	256 MB
LAN	Onboard	Onboard
Video	Onboard	Onboard
Sound	Onboard	Onboard
CD-ROM	No	No
Modem	No	No
OS	Windows® XP Pro	Windows® XP Pro
Warranty	3 Years RTB	3 Years RTB
Part #	(D1740)	(D4546)
GST Inc:	\$1,299	\$1,399
Rent*/wk	\$14.23	\$15.33



IPEX CRT MONITORS

15"

(C5931)
GST Inc:

\$345

17"

(C5932)
GST Inc:

\$459



Iplex have a full range of Windows XP ready PC's. Take advantage of Microsoft's new Operating system with a new PC from Iplex. Choose from Windows XP Home or Professional Editions for home or business.

Everything you need in a PC for your home or small office. With Windows XP Home installed, take advantage of amazing graphics and sound capabilities. Enjoy the web and create CD's with a 56K Modem and CDRW as standard. ****NOTE: 17" Monitor included.**

IPEX SOHO TOWER

Form Factor	T400 Tower	T400 Tower
Processor	Intel® Pentium® 4 1.8 GHz	Intel® Pentium® 4 2.0 GHz
HDD	20 GB	40 GB
RAM	128 MB	256 MB RIMM
LAN	Onboard	10/100 NIC
Video 32MB	Ge force II MX	Ge force II MX
Sound	SB Live	SB Live
CD-ROM	Yes	DVD-ROM
Modem	56K Internal	56K Internal
OS	Windows® XP Home	Windows® XP Home
Warranty	3 Years RTB	3 Years RTB
Part #	(D4159)	(D4157)
GST Inc:	\$2,299	\$2,799
Rent*/wk	\$22.54	\$27.45



Do your
Christmas
Shopping
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HARRIS
TECHNOLOGY

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SEE PAGE

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FOR MORE
DETAILS

The figures quoted are based on a per week basis over 3 years. T.A.P. Terms & Conditions apply

IPEX LCD FLAT SCREEN MONITORS

IPEX 15" LCD

Monitor	15" LCD (C9400)
GST Inc:	\$965
Rent*	\$10.57 /wk



Images for illustration purpose only

IPEX 17" LCD

Monitor	17" LCD (C9401)
GST Inc:	\$1,749
Rent*	\$19.17 /wk



PRICING AND SPECIFICATIONS MAY CHANGE. PLEASE REFER TO PAGE 2 FOR DETAILS.

Sales: 1300 13 9999
Fax: 1300 13 6666

Web: www.ht.com.au
Email: sales@ht.com.au



See Page 2
for Locations

DEC
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CD Writers, Digital Cameras and Monitors

FLY BUY
1,000
BONUS POINTS

Collect
1000 Bonus
Fly Buys
points
when you
purchase
C9879, D1555
D3791, D1552
between
20/11/01 -
31/12/01

CD-R/RW Kit

Internal 16W/10RW/40R IDE CDR/RW Kit

- Anti Buffer-Under Run Technology
- Supports Digital Audio Extraction
- Recording Software supplied
- Easy installation guide included



(C7494)

GST Inc: **\$280**

Memory Stick CD-R/RW Kit

Internal 24W/10RW/40R Memory Stick CDRW

- Two high speed removable media drives in one.
- Writes & Re-writes to Memory Stick and CD-R/RW media
- Sony Buffer-Under-Run Technology
- Recording Software supplied



MEMORY STICK

(C9879) GST Inc: **\$439**

Memory Stick Digital Still Cyber-shot Camera

DSC-P3 Cyber-shot Memory Stick Camera

- 2.8 Mega Pixel
- 3x Precision Digital Zoom
- AF illuminator
- MPEG Movie EX
- ISO Sensitivity
- 2x Burst Mode
- 1.5" LCD & View Finder
- Max Resolution (1920x1440)



NEW



Cyber-shot

(D1555) GST Inc:

\$1,195

DSC-P5 Cyber-shot Memory Stick Camera

- 3.2 Mega Pixel
- 3x Optical Zoom (6x Digital Zoom)
- Clipmotion
- Super HAD Technology
- MPEG Movie EX
- ISO Sensitivity
- 1.5" LCD & View Finder
- Max Resolution (2048x1536)



NEW



Cyber-shot

(D3791) GST Inc:

\$1,585

Cyber-shot Camera

DSC-F707 Cyber-shot Camera

- 5.0 Mega Pixel
- Carl Zeiss Lens
- 5x Optical Zoom (10x Precision Digital Zoom)
- MPEG Movie EX
- Night Shot for MPEG & Stills
- 3x Burst mode
- Max Resolution (2560 x 1920)



NEW



Cyber-shot

(D1552) GST Inc:

\$2,769

Mavica Digital Camera

CD300 Mavica Digital Camera

- CD-R/CD-RW Mavica Digital Still Camera (156 Meg Per CD)
- 3.3 Mega Pixel, Mini CD-R/RW
- 3x Optical Zoom (6x Digital)
- Carl Zeiss Vario Sonnar Lens (52mm Filter Diameter)
- Maximum Images: up to 1300 per 156MB Mini CD-R (640x480 Standard Mode)



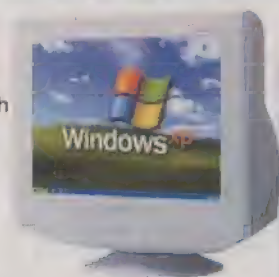
(C4276) GST Inc: **\$2,419**

Flat Display Trinitron Monitors

CPD-G420 19"

FD Trinitron

- 19" FD Trinitron Display
- 0.24-0.25mm Aperture Grille Pitch
- 4 Way Powered USB Hub
- Dual Switchable Inputs (HD15 & BNC x 5)
- Compact, Low-Rise, Two-Tone Cabinet
- Maximum Resolution 1920 x 1440 @ 60Hz
- Sony 3-year Warranty (B7964) GST Inc:



\$1,320

CPD-G520 21"

FD Trinitron

- 21" FD Trinitron Display
- 0.24mm Aperture Grille Pitch
- 4 Way Powered USB Hub
- Dual Switchable Inputs (HD15 & BNC x 5)
- Compact, Low-Rise, Two-Tone Cabinet
- Maximum Resolution 2048 x 1536 @ 60Hz
- Sony 3-year Warranty (B7966) GST Inc:



\$2,195

Memory Stick

Sony's tiny Memory Stick lets you enjoy seamless recording, transfer, storage and playback of audiovisual and other data. Through a wide range of Memory Stick compatible products.

MSA8A
(88647) GST Inc: **\$49**

MSA16A
(86779) GST Inc: **\$69**

MSA32A
(88654) GST Inc: **\$99**

MSA64A
(88648) GST Inc: **\$169**

MSA128A
(C5887) GST Inc: **\$329**

DEC

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SONY

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*The figures quoted are based on a per week basis over 3 years. T.A.P. Terms & Conditions apply.

Prices are subject to change. Check here for latest prices & products!!

Web Direct

www.ht.com.au/cat/sony

New Model VAIO's with Windows XP Home Edition

PCGFX990 Notebook

Pre-installed with Windows XP Home Edition

(D4414)

GST Inc:

\$4,899

Rent* \$45.78/wk

Features

PCGFX990

• Pentium® III 1GHz	• Internal 56kbps Modem
• 15" XGA Display	• Network interface
• Windows® XP Home Edition	• Sony Original Software
• CD-RW/DVD Drive	• i.LINK (IEEE1394) interface
• 128MB RAM	• 2x USB interfaces
• 20GB Hard Drive	• Video Out

PCGFX900 Notebook

Pre-installed with Windows XP Home Edition

(D4415)

GST Inc:

\$3,999

Rent* \$37.37/wk

Features

PCGFX900

• Pentium® III 850MHz	• Internal 56kbps Modem
• 14.1" XGA Display	• Network interface
• Windows® XP Home Edition	• Sony Original Software
• CD-RW/DVD Drive	• i.LINK (IEEE1394) interface
• 128MB RAM	• 2x USB interfaces
• 15GB Hard Drive	• Video Out



Great gift idea's!

Web Direct

See Web Direct Link

(At top of page) for more products and latest info!

New models come with CD-R/RW & DVD Combo Drive



Software supplied with new notebook's:

- Adobe Photoshop Elements
- MovieShaker 3.2
- Symantec Norton AntiVirus 2002
- Intervideo WinDVD™ 3.1
- DVgate 2.4
- SonicStage 1.0
- PictureGear 5.1
- Smart Capture 4.2
- VisualFlow 2.1
- PictureToy 1.1
- DigitalPrint 1.0

PCGR505AFT Notebook

Pre-installed with Windows XP Home Edition

(D4416)

GST Inc:

\$5,199

Rent* \$47.39/wk

Features

PCGR505AFT

• Pentium® III 850MHz	• Internal 56kbps Modem
• 12.1" XGA Display	• Network interface
• Windows® XP Home Edition	• Sony Original Software
• Docking Station Included	• MG Memory Stick Slot
• CD-RW/DVD Drive	• USB interfaces
• 256MB RAM	• i.LINK (IEEE1394) interface
• 30GB Hard Drive	

PCGR505AGT Notebook

Pre-installed with Windows XP Home Edition

(D4417)

GST Inc:

\$4,899

Rent* \$45.78/wk

Features

PCGR505AGT

• Pentium® III 750MHz	• Internal 56kbps Modem
• 12.1" XGA Display	• Network interface
• Windows® XP Home Edition	• Sony Original Software
• Docking Station Included	• MG Memory Stick Slot
• CD-RW/DVD Drive	• USB interfaces
• 128MB RAM	• i.LINK (IEEE1394) interface
• 20GB Hard Drive	

NO FURTHER DISCOUNTS AVAILABLE ON...

ALL SONY NOTEBOOKS AND ACCESSORIES SOLD FROM **HARRIS TECHNOLOGY**

PRICING AND SPECIFICATIONS MAY CHANGE. PLEASE REFER TO PAGE 2 FOR DETAILS.

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Fax: 1300 13 6666

Web: www.ht.com.au
Email: sales@ht.com.au



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DEC
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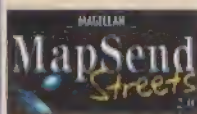
World Leaders in GPS Systems



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TECHNOLOGY

MapSend Streets For Magellan

Map 330 & 330M



(C7662)
NSW + ACT
other states
are available FROM
\$149
GST Inc:
*Per state

Magellan's MapSend Streets Australia software provides authorised Australian Street level data to be uploaded to your MAP330 to compliment the preloaded road and highway data. The latest Government map data is included on the 7 State based CD's available showing every street listed by suburb in each state.

Magellan MAP 330 & 330M

NEW

With marine
navdata
database



(C5893)

GST Inc:

\$849

(D1036)

GST Inc:

\$895

Boasting the most memory in its class, the Magellan MAP 330 is designed to meet the stringent navigation needs of the outdoor enthusiast, and for those who also travel out in the water, the MAP 330M is ideal with its marine Navdata database. Both units have a built 8MB base map which includes Australian cities, highways, major roads, waterways and airports. The MAP 330M also includes fixed navigation aids, buoys and lighthouses.

Features:

- Powerful 12 parallel channel receiver and super sensitive quadrifilar antenna for fast satellite signal locking and accurate tracking.
- Built in 8MB map database displays major roads, highways, cities and other navigable details with advanced map database search.
- MAP 330M includes 1MB of memory for Marine Navdata database.
- 8Mb of FLASH memory for MAP 330, 7Mb of FLASH memory for MAP330M
- PC Upload/download capability for additional street detail via the optional MapSend Streets CDROM.

Magellan GPS Map Companion



(C6108)

Magellan GPS Map Companion

* refer to side
bar for detail
of GPS Map
Companion
clip image



*Palm V series
not included

(B7496) GST Inc:

\$690

Turn your Palm V or Vx handheld into a powerful navigation tool that can pinpoint your location to within 10m on Australian street maps. Just clip the GPS Companion onto your Palm V series handheld and the receiver pinpoints your location.

Features:

- Powerful 12 parallel channel receiver with powerful tracking in most environments.
- Up to 10 hours on 2 AAA alkaline batteries.
- Compatible with most Palm software that access GPS
- Displays AMG/MGA position, Lat/Long, Elevation, Trip, Speed, Heading, Bearing, Odometer, Waypoints, Routes, GPS battery life and more!
- Weighs only 110gms.

Magellan GPS 320 & 315

GPS 320

GPS320 has a
built in marine
navdata data
base and a
power /
PC cable



(B7508)

GST Inc:

\$599

GPS315



(B7506)

GST Inc:

\$499

The GPS 320 & 315 will take you where you want to go. Its built-in database puts more than 15,000 cities, additionally the GPS 320 includes marine navdata in the palm of your hand. Nine navigation screen's provide all the information you need on a high resolution, EL backlit display.

Features:

- Powerful 12 parallel-channel receiver
- Built in database of world-wide cities.
- 12hrs of continuous battery life on two AA batteries
- 1200 point SmartTrack records your path; BackTrack brings you home again
- Store 500 waypoints.
- Weatherproof, compact and lightweight

Optional Accessories for GPS 310, 315, 320 & 330

- Vehicle Mounting Bracket

(B7515) GST Inc: **\$104**

- Aquapac, clear plastic waterproof case to hold your electronic equipment and valuables.

(C4290) GST Inc: from **\$35**



- Power data cable adaptor



- Power cable

(B7519) GST Inc: **\$109**

(B7509) GST Inc: **\$55**

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FINANCE METHODS
ARE SUBJECT TO
APPROVAL

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Directwww.ht.com.au/cat/rentsmart

Stay ahead in business

Introducing RentSmart, the smart new way to stay ahead in business. With RentSmart, you'll always have the latest computers, technology and office equipment for your business, because you rent everything you need, rather than purchasing it outright.

3 GREAT REASONS TO RENT

1. Spend Our Money Not Yours

With RentSmart, there are no large up front costs. Instead you spread affordable monthly payments over the useful life of your equipment. That's usually 2-3 years. And when your equipment is used solely for business, your rentals can also be 100% tax deductible.

2. Get More Equipment

Bundle together a wide range of business equipment, computer software and office furniture all into one convenient RentSmart plan. You can get all the equipment you need for your office from just a few dollars a week.

3. Always Have The Latest

RentSmart gives you access to the latest technology on a continual basis because you can update your equipment whenever you need*. Either add more equipment to your existing RentSmart plan, or trade in your old for new. That's the beauty of RentSmart and it's a luxury cash buyers don't have.

WHO CAN RENTSMART?

All sorts of business people can RentSmart. All you need is 1 year trading history, a good credit rating and an approval by RentSmart.

For More Information:

- Contact **RentSmart Direct**
1300 855 555
- Contact **Harris Technology**
1300 139 999
- Or **Apply Online**
www.ht.com.au



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products
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info!

Check out the table below to see how cost effective renting really is.

PRICE	48 MONTHS (PER WEEK PRICE)	36 MONTHS (PER WEEK PRICE)	24 MONTHS (PER WEEK PRICE)
\$550	\$4.63	\$6.03	\$7.55
\$1000	\$8.42	\$10.96	\$13.73
\$1500	\$12.63	\$16.44	\$20.60
\$2000	\$16.85	\$21.92	\$27.46
\$3000	\$24.92	\$29.42	\$39.12

Please note: prices listed are intended as a guide only. Rental prices quoted are GST inclusive.

RENTSMART

BECAUSE BUYING ISN'T.

DEC

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APC Surge Arrest-PNote Pro®



Back-Ups for PC's!

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GST INC
\$279



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(71087)
GST INC
\$13,529

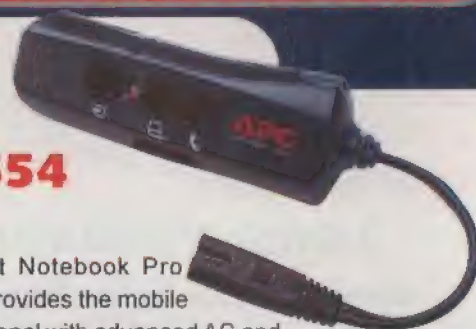
So good we use
it ourselves!



Surge
Arrest 5 Strip
(A0098)
GST INC
\$56

An APC SurgeArrest is your guarantee that your hardware and valuable electronics are protected regardless of lightning strikes and everyday unexpected power surges. SurgeArrest also offers the best protection from line noise which can cause glitches and errors in electronic operations and computer data.

PNote Pro
(99592) GST INC **\$54**



The SurgeArrest Notebook Pro Surge Protector provides the mobile notebook professional with advanced AC and telephone line protection. The unique, in-line design creates a compact, lightweight surge protector that is truly portable and appropriate for use in any country throughout the world. With built-in Excess Current Detection, the Notebook Pro warns you against potential modem damage. A Velcro mounting strap and 6 ft. telephone cord eliminate the need to carry any additional accessories.

APC Back Ups Pro® for Workstations

Smart battery backup & high performance surge suppression for Windows 95 & NT PCs

- PowerChute® Plus software lets your UPS shut down your applications gracefully in the event of an extended power failure
- Additional outlet for protection of printers
- Audible alarms
- Phone/modem protection
- User replaceable, hot swappable batteries

APC Back-UPS Pro 280si (76636) GST INC **\$260**

APC Back-UPS Pro 420si (76637) GST INC **\$349**



APC Back-UPS Pro 650si (76638) GST INC **\$485**

APC Smart-UPS Rack Mounts® for Servers

Smart-UPS 700, 1000, and 1400 2U Rack Mounts

Network power protection to increase availability of your system. APC Smart-UPS 2U Rackmount features include longer runtime to keep your system safe and a 2U design to save your valuable rack space by 30%. Hot swapping batteries is also now faster and easier with the replacement battery chassis tray.



APC Smart-UPS 2u700VA (99595) GST INC **\$678**

APC Smart-UPS 2u1000VA (99596) GST INC **\$969**

APC Smart-UPS 2u1400VA (99597) GST INC **\$1,465**

Ask
About...



DEC
18

Quantum

Prices are subject to change. Check here for latest prices & products!!

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Direct

www.ht.com.au/cat/quantum

Simple, Robust and Cost-effective Network Storage

INSTALL UP TO 960GB ON YOUR NETWORK IN MINUTES!!!

Snap Servers

Snap Servers are engineered for one purpose: file sharing. That's why they can be up and running on a LAN in just minutes! Snap Servers offer you the perfect combination of quick and easy installation when compared to an NT server. Snap Servers are pre-configured to work in all major network environments, which means you just plug it in and turn it on, with no network downtime.



Snap Servers are part of a growing group of peripherals called Network Attached Storage (NAS) devices. These NAS devices are single-purpose, self-contained appliances, rather than complex external computer systems like conventional file servers.

- 40GB (C0035) GST Inc: **\$1,499**
Rent* **\$21.90/wk**
- 80GB (D1206) GST Inc: **\$2,299**
Rent* **\$22.54/wk**
- 160GB (D1208) GST Inc: **\$4,099**
Rent* **\$38.30/wk**
- 240GB (A8119) GST Inc: **\$8,499**
Rent* **\$81.90/wk**
- 400GB (D1207) GST Inc: **\$12,999**
Rent* **\$106.49/wk**
- 960GB (C9169) GST Inc: **\$39,600**

Simple Network Storage

Snap Server is optimised for a single purpose: data storage. This embedded, highly optimised OS code provides four key benefits:

- Higher Reliability - Greatly reduced opportunities for conflicts, failures or crashes which means high availability of data.
- Faster Performance - Only necessary tasks are performed so CPU cycles are dedicated to what is most critical - data storage and file serving.
- Ease of Use - Install in minutes, automatically recognize and support all major network platforms and can be managed via a simple Web browser.
- Less Maintenance - There are no recurring service packs, patches or bug fixes as with conventional operating systems.

Dramatically Reduces Costs

From both an acquisition cost stand point and an overall Total Cost of Ownership (TCO) stand-point, the Snap Server delivers dramatic savings compared to more complex Windows 2000/NT file servers.

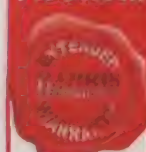
The Right Capacity

Snap Servers come in a number of capacities to meet any storage need or requirement.



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17

FOR MORE
DETAILS

The figures quoted are based on a per week basis over 3 years. T.A.P. Terms & Conditions apply.



1. Plug into AC power



2. Connect to Ethernet hub



3. Turn Snap Server on



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Delivery
Australia-Wide

DEC
19

Next Generation Backup Solutions

media

DLT Tape Media IIIXT
15/30GB Tape
(68362) GST Inc: **\$80**

DLT Tape IV
Media 20/80GB
(71231) GST Inc: **\$155**

DLT Cleaning Tapes
(97851) GST Inc: **\$93**

Super DLT Media
110/220 GB
(B9825) GST Inc: **\$330**

Exatape 112 - 8mm
(C1976) GST Inc: **\$12**

Exatape 160 - 8mm
(C1980) GST Inc: **\$22**

Exatape AME - 125m
(C1986) GST Inc: **\$105**

Exatape AME - 170m
(77600) GST Inc: **\$170**

Exatape AME 2-150m
(C1989) GST Inc: **\$180**

Exatape 8mm
Cleaning Tape
(C1982) GST Inc: **\$29**

Exatape AME 18c
Cleaning Tape
(C1983) GST Inc: **\$36**

Exabyte VXA1 -
V6 12/24 GB
(91103) GST Inc: **\$89**

Exabyte VXA1 -
V10 20/40 GB
(C3945) GST Inc: **\$129**

Exabyte VXA1 -
V17 33/66 GB
(91105) GST Inc: **\$197**

Exabyte VXA1 -
1m Cleaning Tape
(91104) GST Inc: **\$102**

LTO Ultrium
100/200 GB Tape
(D1500) GST Inc: **\$298**

Quantum



QUANTUM DLT TAPE DRIVES

Quantum DLT1 economy tape Internal Drives (88037) GST Inc: **\$2,925**

Quantum DLT1 economy tape External Drives (88038) GST Inc: **\$3,420**

Quantum DLT8000/S Internal 40/80GB (82501) GST Inc: **\$6,175**

Quantum DLT8000/ST External 40/80GB (82502) GST Inc: **\$6,719**

Quantum SDLT220/S Internal 110/220GB (B9821) GST Inc: **\$11,495**

Quantum SDLT220/ST External 110/220GB (B9823) GST Inc: **\$11,950**

LTO ULTRIUM

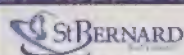


LTO Ultrium Tape Drive

- 100GB Native, and 200GB compressed capacity per tape.
- 16 Mb/Sec sustained, that is 57 GB/Hour!
- Ultra wide LVD SCSI interface and includes Data tape and cleaning tape.
- Compatible with most common backup software.
- Includes one year on site warranty for a limited time*

LTO Ultrium Tape Drive (Internal Drive) (D1509) GST Inc: **\$10,350**

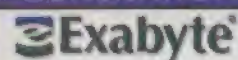
LTO Ultrium Tape Drive (External Drive) (D1508) GST Inc: **\$10,995**



Update EXPERT is a utility that allows Network managers to keep their NT and certain Microsoft product hotfixes and service packs up to date by analysing which service packs are installed on the NT servers or workstations. It also facilitates locating, downloading and installing the latest packs locally or remotely from a central location.

75 Server Base System Licence!

Update EXPERT (C4999) GST Inc: **\$2,670**



VXA 1 TAPE DRIVE

- 33 GB native, 66 GB Compressed (using V17 tape)
- 3-6MB sec sustained, that's 21.6GB/Hr
- SCSI-LVD & new Firewire models available in white & translucent
- Variable speed operation matches data throughput to your computer
- LINUX and Apple Mac approved.
- Compatible with most backup software

VXA 1 TAPE DRIVE (Internal) (C1847) GST Inc: **\$2,170**

VXA 1 TAPE DRIVE (External) (C1915) GST Inc: **\$2,615**

VXA 1 TAPE DRIVE (External Bundle with Retrospect Backup Software) (B1856) GST Inc: **\$2,995**



DLT1 AUTOLOADER

- 400 GB native, 800 GB compressed capacity
- DLT1 Single Tape Drive included
- 10 tape capacity
- Overland DLT reliability
- LVD 68 pin SCSI interface
- Includes 1 data tape and cable
- 20 GB/Hr throughput.
- Optional On-site warranty.

(A0476) GST Inc:

\$10,999

* Super DLT and LTO models also available



Intelligent KVM and USB Products

SERVERLINK KVM SWITCHES

The ServerLink Infinity range of Auto KVM switches allow you to control multiple PCs or network servers with one monitor, keyboard and mouse. All ServerLink KVM switches feature **On-Screen-Display** and keyboard & mouse emulation to guarantee error free switching and flawless booting.



ServerLink Infinity Range

SERVERLINK INFINITY

3 YEAR WARRANTY

SL-221	2 port ServerLink KVM for PS/2 only	(B3047) ...	\$270
SL-221-P	2 port ServerLink KVM inc. 2 x 2m PS/2 cables	(B3048) ...	\$310
SL-421	4 port ServerLink KVM for PS/2 only	(A9890) ...	\$339
SL-421-P	4 port ServerLink KVM inc. 4 x 2m PS/2 cables	(B2759) ...	\$425
SL-821	8 port ServerLink KVM for PS/2 only	(97888) ...	\$979
SL-821-P	8 port ServerLink KVM inc. 8 x 2m PS/2 cables	(97889) ...	\$1,159
SL-1621	16 port ServerLink KVM for PS/2 only	(97890) ...	\$1,672
SL-1621-P	16 port ServerLink KVM inc. 16 x 2m PS/2 cables ..	(97891) ...	\$2,019
SL-CKP-02 ...	2m 3-in-1 Comp. to ServerLink cable for PS/2	(63972) ...	\$27
SL-CKP-03 ...	3m 3-in-1 Comp. to ServerLink cable for PS/2	(D0973) ...	\$38
SL-CKP-05 ...	5m 3-in-1 Comp. to ServerLink cable for PS/2	(63976) ...	\$59



CYBEX AUTOVIEW 200 KVM SWITCH

Control up to 8 computers simultaneously from 2 locations. The second user can be up to 150 metres away using standard Cat5 UTP cabling.

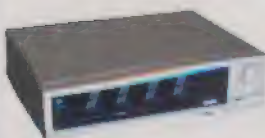


AV200R-8	2 user 8 port KVM switch for PS/2 & AT/Serial	(97950) ...	\$2,965
RMK-33	19" Rack mount kit for AV200R-8	(77284) ...	\$55
CIFCA-4	1.2m 3-in-1 Comp. to AutoView cable for PS/2	(B6728) ...	\$77
CIFCA-8	2.6m 3-in-1 Comp. to AutoView cable for PS/2	(B9703) ...	\$120
CIFCA-15	5m 3-in-1 Comp. to AutoView cable for PS/2	(B5488) ...	\$192

FULL RANGE OF CYBEX PRODUCTS AVAILABLE!

COMSOL USB KVM SWITCH

Control 4 USB computers from a single USB keyboard, USB mouse and VGA monitor. This USB KVM switch also allows the 4 computers to share 2 USB peripherals such as printers, scanners or storage devices



UKS-401	4 port USB KVM switch with 2 port USB Hub	(D0970) ...	\$299
USB-AB-02 ...	2m Computer to KVM cable for USB	(69356) ...	\$7
USB-AB-05 ...	5m Computer to KVM cable for USB	(69358) ...	\$12
H15MF-02-H ..	2m Computer to KVM cable for VGA	(57884) ...	\$19
H15MF-05-H ..	5m Computer to KVM cable for VGA	(60022) ...	\$33

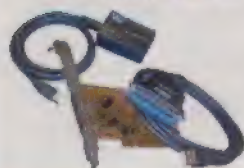
COMSOL USB HUBS

UH-201	2 port USB Hub	(82695) ...	\$47
UH-401	4 port USB Hub	(82696) ...	\$61
UH-701	7 port USB Hub	(82697) ...	\$105



COMSOL USB CONVERTERS

UPC-100	USB to IEEE1284 printer converter	(82692) ...	\$55
UMC-100	USB to RS232 9 pin serial converter	(80782) ...	\$70
UEC-100	USB to 10/100 Ethernet converter	(82594) ...	\$145
UKMC-100 ...	USB to PS/2 KB & Mouse converter	(B0557) ...	\$70
USC-100	USB to SCSI 2 (HPD50M) converter	(D0937) ...	\$180
UPCI-100	2 port USB PCI controller card	(B4493) ...	\$44



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DSL-504 ADSL Router with 4 port 10/100 Switch

Connect single or multiple PC's
on an Ethernet LAN to an ADSL

(C7593) GST INC

\$645



DSL-200 ADSL Modem designed for high speed internet access

(B7197) GST INC

\$299

DSL-300 Ethernet ADSL Modem

Connect single or multiple PC's on an Ethernet
LAN to an ADSL

(B7198) GST INC

\$399

DSL-100D Internal PCI ADSL Modem

Compatible for Windows based PC's to connect
via G.lite or G.dmt

(B7196) GST INC

\$229

DSL-500 ADSL Router

Connect single or multiple PC's on an Ethernet
LAN to an ADSL

(D0801) GST INC

\$459

ADSL / Cable Router

NEW

DI-713P 11 Mbps Wireless IP Residential Gateway for x DSL and Cable modems with switch and print server

(C7596) GST INC

\$745



DI-804 IP Residential Gateway for xDSL and Cable Modems with 4-port 10/100Mbps Switch.

(C2361) GST INC

\$369

DI-701 10/100 IP Residential Gateway for xDSL and Cable Modems. Internet ready.

(98249) GST INC

\$285

10/100 Switches

DES-1024R 24-Port 10/100Mbps Fast Ethernet Unmanaged with 24 N-Way UTP ports.

(98256) GST INC

\$849



DES-1005D 5 Port 10/100Mbps Fast Ethernet Switch with 5 x N-Way UTP Ports. Palm Size

(85101) GST INC

\$149

DES-1008D 8 Port 10/100Mbps Fast Ethernet Switch with 8 x N-Way UTP Ports. Palm Size

(98254) GST INC

\$239

DES-1016R+ 16 Port 10/100Mbps Fast Ethernet Ethernet Unmanaged with 16 N-Way UTP Ports. Rackmount Size

(D4164) GST INC

\$699

DES-1032 32 Port 10/100Mbps Fast Ethernet Unmanaged Switch with 32 N-Way UTP Ports. Rackmount Size

(B7165) GST INC

\$1,299

Gigabit Solution

DES-1218 Gigabit Ethernet Switch - Unmanaged - 16 port 10/100Mbps Fast Ethernet with optional 2 x 1000BaseSX ports (SC) Module DGE-550T PCI-bus 1000M Gigabit Ethernet Network Interface Card with RJ45 (Copper) Connector

(B7166) GST INC

\$975



DES-1009G Gigabit ethernet Switch 8 Port 10/100Mbps Fast Ethernet Unmanaged Switch with 1 Port 1000Base T Gigabit (Copper)

(D1196) GST INC

\$749

DES-3326 24 Port 10/100Mbps Fast Ethernet Layer 3 Managed Switch with optional 2 Port Gigabit Module Slot

(D1197) GST INC

\$3,229

DES-3225G 24 Port 10/100Mbps Fast Ethernet Layer 3 Managed Switch with optional 2 Port Gigabit Module Slot

(90755) GST INC

\$1,820

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Home Networking

Wireless Solutions

DWL-905 Wireless LAN PCMCIA starter Kit

- 2 x Wireless LAN PCMCIA Cards (DWL-650)
- 1 x Wireless LAN Access Point (DWL-1000AP)

(C0713) GST INC **\$1,129**



NEW

DWL-120 11Mbps Wireless LAN USB Adapter

(A8487) GST INC **\$329**

DWL-650 11 Mbps Wireless LAN PCMCIA Card

(A9247) GST INC **\$270**

DWL-500 11Mbps Wireless LAN PCI Card

(A9241) GST INC **\$349**

DWL-1000AP 11Mbps Wireless LAN Access Point

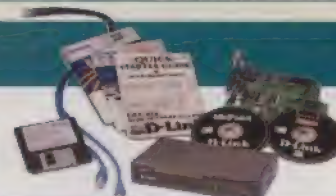
(A9251) GST INC **\$639**

Ethernet Networking

DFE-910

Performance Network Kit 2 x 10/100 MB PCI Network adapters

(88060) GST INC **\$295**



DSS-5+ 5 Port 10/100 Mps Dual Speed Switch

(89269) GST INC **\$179**

DSS-8+ 8 Port 10/100 Mps Dual Speed Switch

(C2935) GST INC **\$289**

RDE-805TP 5 Port 10 Base-T Ethernet Unmanaged Hub

(88048) GST INC **\$89**

DFE-530TX+ PCI-bus 10/100M Fast Ethernet Network Interface Card

(88046) GST INC **\$49**

DSS-16+ 16 Port 10/100 Mps Dual Speed Switch

(D1525) GST INC **\$528**

USB Peripherals

DSB-H4 DSB-H4 4 Port USB Hub

4 USB Type A ports for Downstream connection to 4 USB devices, 1 USB Type B port for Upstream

(C7580) GST INC **\$75**



DSB-500 2 Port USB PCI Adapter

(D0984) GST INC **\$52**

DSB-V100 USB Digital Video Capture Device

(C2366) GST INC **\$159**

DSC-100 100K Dual Mode Camera

(D0985) GST INC **\$149**

DSC-350 Dual mode Digital Still camera

(B3268) GST INC **\$312**

56K Modem

DFM-560E DFM-560E External 56K VOICE & Data

ITU-T V.90 and K56flex Auto-Detect 56Kbps capable download speed from Internet Service Provider supporting 56K Flex.

(B6479) GST INC **\$109**



DU-560M

USB 56K Voice and Data Modem

(98261) GST INC **\$99**

DFM-560i

Internal, 56k Voice and Data Modem

(74361) GST INC **\$69**

DKVM-2

Pro-connect 2 Port Keyboard-Video-Mouse Switch

(C7576) GST INC **\$199**



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- 1.83m Power Cord
- Telephone/Fax/Modem and UTP
- (RJ45) Protection
- 1.83m Telephone Cable
- RS-232 Communication Cable
- EMI/RFI Filtration

350VA

F6C350zSER-SB
(192 Watts)
(C9277)
GST Inc:
\$189

500VA

F6C500zSER-SB
(300 Watts)
(C9278)
GST Inc:
\$249

650VA

F6C650zSER-SB
(360Watts)
(C9279)
GST Inc:
\$329

Surge control is important because even small surges or spikes can eventually destroy or affect the performance of expensive electronic equipment such as a computer, phone, fax, TV, VCR, stereo or microwave. Damage can occur either instantaneously or over time as smaller surges cause the gradual deterioration of internal circuitry, to voltage fluctuations.

No Hassle Warranties Belkin offer the best Connected Equipment warranties in the business. Full warranty protection means your equipment is insured against damage due to power disturbances of all kinds - surges, spikes, even lightning strikes.

Connected Equipment Warranties up to \$25,000.

Connected Equipment Warranty up to \$50,000.

Connected Equipment Warranties up to \$80,000.

Home Office Range

F5C205z4



Belkin's SurgeMaster line has been designed to protect entry-level computers, dot matrix printers, personal copiers and all other sensitive electronics in the home or office.

Telephone/fax/modem protection
5 socket's
27,000 Amps of AC protection

(C4603) GST Inc: **\$79**

Superior Grade

F5C206z2



Pentium III computers, audio/video equipment and office equipment need extra protection.

• 6-way Superior Grade range AC Line protection

Blocked space adapters

(C4604) GST Inc: **\$105**

Maximum Grade

F5C208z2



Maximum Grade series ideal for protecting commercial business computers, ADSL and cable modems, high-end printers and copiers, and sensitive audio/video equipment such as satellite receivers and home cinema systems.

8 socket's
39,000 Amps of AC protection

(C4607) GST Inc: **\$135**

PDA ACCESSORIES

F8E391

Universal PDA Case
Finegrain Leather-Black
(B6767)
GST Inc:
\$39

Tan

(C4690)
GST Inc:
\$39

F5U109

USB PDA Adapter
(B6768)
GST Inc:
\$59

F3X

1051-03
Hot Sync Cable for Palm III/VII
(C4685)
GST Inc:
\$39

Belkin Has All Of Your Mobility Solutions!

USB pocket Hub

F5U007-UNV-AUS

The Belkin Pocket Hub allows you to instantly connect USB devices such as printers, scanners, external mice and keyboards, joysticks, digital cameras, or other USB hubs without having to restart your computer.

(C4577) GST Inc: **\$65**

Optical MiniScroller™

F8E882

Smaller than the standard mouse, the Optical MiniScroller™ is perfect for travelers. No bulky mouse taking up prime space in your notebook bag. USB or PS/2 compatible, it features 8-directional scrolling and one-touch zoom control. It works with Windows™ 95, 98, Windows NT and W2000.

(C4699) GST Inc: **\$49**

DockStation™

F5U120-PC-AUS

The DockStation™ combines four USB devices, one parallel device, one serial device, and two PS/2 ports with a single USB port on your PC. •Supports serial port speeds at up to 230 Kbps. •Includes a 2.5 Amp power supply to provide true 500mA downstream current on USB ports.

(B6752) GST Inc: **\$298**

USB Switch

F1U200



The Belkin 4-Port USB Switch is the ideal solution for sharing a printer or any USB device, with up to four USB computers as well as, share multiple peripherals with up to four USB computers

(D3161) GST Inc: **\$99**

USB VideoBus II

F5U208



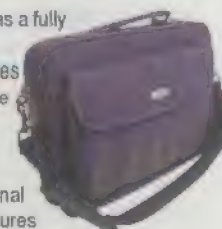
You create the show yourself with your PC & camcorder merged into a desktop video studio by the Belkin USB VideoBus II. The Belkin USB VideoBus II, complete with MGI VideoWave III SE software, gives your PC the power to make stunning movies & more!

(B4412) GST Inc: **\$145**

Stone St Laptop Bag

F8E157

The Stone Street has a fully padded computer section that measures 39 x 28 x 10, for the most popular notebook style computers, and a fully equipped external pocket which measures 36 x 25 x 7.



(B6769) GST Inc: **\$59**

Don't Forget...

Belkin - KVM Switches allow one keyboard, video monitor and mouse to control multiple computers - from 2 to 256.

KVM ESeries & SoHo Rage

F1DB102P
F1DB104P
F1DB102P-Economy-
2 Port KVM Switch - P/S 2

F1DB104P-Economy-
4 Port VM Switch - P/S 2


*D.C.= Daisy Chainable

 (D3162) GST Inc. **\$95**

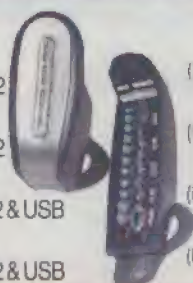
 (D3159) GST Inc. **\$176**

KVM ESeries & SoHo Rage

F1DS102P
F1DS102P SoHo
2 Port KVM Switch - P/S 2

F1DS104P SoHo
4 Port KVM Switch - P/S 2

F1DS102T SoHo
2 Port KVM Switch - P/S 2 & USB

F1DS104T SoHo
4 Port KVM Switch - P/S 2 & USB

 (D3163) GST Inc. **\$289**

 (D3166) GST Inc. **\$369**

 (D3165) GST Inc. **\$349**

 (D3167) GST Inc. **\$449**

Omniview Pro KVM Products

F1D104-OSD-AUS
F1D108-OSD-AUS
F1D104-OSD-AUS- 4 Port KVM Switch (A7797) GST Inc. **\$789**
F1D108-OSD-AUS- 8 Port with On-screen display (A7798) GST Inc. **\$885**
F1D116-OSD-AUS- 16 Port with On-screen display PS/2 only (C4663) GST Inc. **\$1,849**
F1D208-OSD-AUS- Matrix 2X8 with On-screen display (C4664) GST Inc. **\$1,949**

Omniview KVM Accessories

F1D103- Rackmount Kit (C4666) GST Inc. **\$95**
F1D084- CAT5 KVM extender up to 150m (C4667) GST Inc. **\$779**
F1D087- Keyboard/Mouse extender (C4668) GST Inc. **\$124**
F1D088- Monitor extender (C4669) GST Inc. **\$124**
F1D089- Keyboard splitter (C4670) GST Inc. **\$124**
F1D090- Mouse splitter (C4671) GST Inc. **\$124**

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Wide**

Omniview PS/2 KVM Cables



The easiest & neatest way to connect all your computers and servers to your PS/2 & USB KVM switches, providing image clarity for high-resolution applications.

F3X1835-06-GLD

All-in-one PS/2 Gold Series Kit, 1.8m

 (C4674) GST Inc. **\$59**
F3X1835-10-GLD- All-in-one PS/2 Gold Series Kit, 3m

 (C4089) GST Inc. **\$94**
F3X1835b15-GLD- All-in-one PS/2 Gold Series Kit, 4.5m- bag pack only

 (C4676) GST Inc. **\$94**
F3X1835b25-GLD- All-in-one PS/2 Gold Series Kit, 7.5m- bag pack only

 (C4677) GST Inc. **\$107**

Omniview USB KVM Cables

F3X1962-06- All-in-one USB Pro Series Plus Kit, 1.8m

 (C4680) GST Inc. **\$37**
F3X1962-10- All-in-one USB Pro Series Plus Kit, 3m

 (C4681) GST Inc. **\$64**
F3X1895-06-GLD- All-in-one USB Gold Series Kit, 1.8m

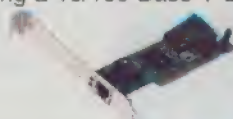
 (C4682) GST Inc. **\$67**
F3X1895-10-GLD- All-in-one USB Gold Series Kit, 3m

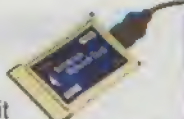
 (C4683) GST Inc. **\$74**

Desktop and Mobile Network solutions

Belkin NIC Cards are the best solution for connecting your desktop PC or notebook to a cable or DSL Internet modem or building a 10/100 Base-T Ethernet network.

F5D5000

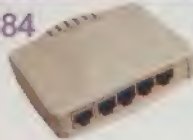
 10/100Mbps
PCI NIC

 (C5581) GST Inc. **\$29**
F5D5020

 10/100Mbps
PCMCIA NIC - 16 Bit

 (C5583) GST Inc. **\$99**
F5D5010

 10/100Mbps
CardBus NIC - 32 Bit

 (C5582) GST Inc. **\$149**

Network Hubs and Switches

F5D384
F5D5130z5

 (C5584) GST Inc. **\$66**
F5D5130Z5- 5-Port Network Switch (10/100Mbps)

 (D4192) GST Inc. **\$147**
F5D5130Z8- 8-Port Network Switch (10/100Mbps)

 (D4193) GST Inc. **\$189**

Network Starter Kits


F5D9001-5M Starter kit(2x10/100 PCICard & 5m Cat5e cable) (D4078) GST Inc. **\$74**
F5D9002-5M Mobile kit(1xPCMCIA Card & 5m Cat5e cable) (D4084) GST Inc. **\$153**
F5D9101-5M Pro kit(1x5 Port 2x10/100 PCI & 5m Cat5e cable) (D4085) GST Inc. **\$199**

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(at top of page)
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and
latest
info!




NETGEAR™

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Direct

www.ht.com.au/cat/netgear

Everybody's Connecting

Enquire
for
pricing
on
Netgear
10 Mbps
hubs.



Shared Internet Access

NETGEAR have a comprehensive range of Cable/DSL routers. All products offer standard shared internet access with NAT Firewall security and easy installation via web based configuration and DHCP.

The products are plug and play and are ideal for connection to either Cable/DSL or satellite broadband services. www.netgear.com.au offers specific installation information on both Telstra and Optus services.



RT 311 Cable/DSL router with
1 10/100 port
(97719) GST INC **\$305**



RP114 Cable/DSL router with
integrated 4 port 10/100 switch and
ability to control web content
(C5592) GST INC **\$399**

R0318 Cable/DSL Security router
with integrated 8 port 10/100 switch
(C4896) GST INC **\$510**

FR318 Cable/DSL firewall
router with integrated 8 port 10/100
switch upgrade to vpn end point
(D1526) GST INC **\$759** NEW

FV318 Cable/DSL VPN Router
includes 5 VPN end points, firewall and
integrated 8 port 10/100 switch
(C2298) GST INC **\$1,663**

RT 314 Cable/DSL router with
integrated 4 port 10/100 switch
(A8862) GST INC **\$415**

Wireless Connectivity

The NETGEAR wireless family means that you never have to be tied down by your cabling again. Whether you are looking to add to your wired Ethernet network or set up a new network these standards based 802.11b products allow you to share network resources without the need for cabling. These plug and play devices are easy to install are WiFi certified and come with WEP encryption.



MA301
PCI Adapter
Cradle
(B9927)
GST INC **\$105**



MA401
PCMCIA
Adapter
(C8117)
GST INC **\$319**



ME102
Wireless
Access Point
(B9929)
GST INC **\$705**



MA 101
Wireless
USB
Adapter
(C7110)
GST INC **\$335**



MR 314
Cable/DSL router with
integrated 4 port 10/
100 switch & built in
access point
(C5223)
GST INC **\$679**

Printer Servers

The NETGEAR print servers enable you to connect your printers to a network for sharing amongst multiple PC's



PS 110 10/100 Mbps Print Server, 2
parallel ports (67226) GST INC **\$270**

PS 113 10/100 Mbps Print Server, 3
parallel ports (A3287) GST INC **\$415**

MA BUNDLE!
Buy the
MA401
and the
MA101 -
Get the
MA301 for
FREE!
(D4280)
GST INC
\$654

MR BUNDLE!
Buy the
MR314
and get
the MA401
for **HALF**
PRICE!
(D4278)
GST INC
\$839

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NETGEAR™

Prices are subject to change. Check here for latest prices & products!!

Web
Direct

www.ht.com.au/cat/netgear

Everybody's Connecting

Modular Switches

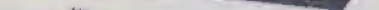
NETGEAR has introduced a new range of modular switches that allow high performance non blocking 10/100 performance out of the box with the ability to add 2 high performance Gigabit modules now or at a later date. Fibre or copper modules are available and can be mixed. As with all NETGEAR products their installation is automatic.

FS726 24 Port 10/100, 2 Module slots

(D0873)

GST INC

\$1,485



FS750 48 Port 10/100, 2 Module slots

(D0874)

GST INC

\$2,598



AG711T

(D0921)

Copper module

GST INC **\$729**



AG711F

(D0924)

Fibre module

GST INC **\$1,049**



Gigabit Solutions

These high performance Gigabit switches provides either fibre or copper backbone connectivity for power workgroups, data centres and server farms. No additional modules are required - each product is ready to install straight from the box.

GA 302T 32 bit PCI gigabit network card

(D4118) GST INC

\$call



GA 302T

GA 622T 32/64 bit PCI gigabit network card

(B9943) GST INC

\$355

GS 504T 4 port 100/1000 (Copper)

(A1375) GST INC

\$2,449

GS 508T 8 port 100/1000 gigabit switch

(B9916) GST INC

\$3,029

FS 509T 1Port 10/100BT Switch w/1 1000BT Uplink

(D1004) GST INC

\$889

FS 518T 2 port 100/1000 with 16 ports 10/100

(A1374) GST INC

\$2,250

FS 517TS 1 port 100/1000 and 16 port 10/100 stackable switch (copper)

(C2299) GST INC

\$1,649

10/100 Switching Solutions



FS 116

FS 105 5 port 10/100 autosensing switch

(84722) GST INC

\$159

FS 108 8 port 10/100 autosensing switch

(70905) GST INC

\$249

FS 116 16 port 10/100 autosensing switch

(A5347) GST INC

\$512

FS 516 16 port 10/100 auto-sensing and internal PSU/Vista

(60522) GST INC

\$859

FS 524 24 port 10/100 switch

(77549) GST INC

\$979

FS 524S 24 port 10/100 switch - stackable

(B6540) GST INC

\$1,639

NETGEAR Starter Kits

Everything you need to start networking right away. Within a few minutes you will be able to share files and printer, exchange emails, play interactive games and share access to the internet.



SB 105 5-Port/10Mb Hub 2x10/100, PCI, cables, internet sharing software

(A3293) GST INC

\$129

FB 105 5-Port/10/100M Switch 2x10/100, PCI, cables, internet sharing software

(A3935) GST INC

\$229

Network Cards

FA 311 Ethernet Adapter 10/100 PCI (A1372) GST INC

\$42



FA 312 10/100 Wake on Lan Ethernet Adapter (A1373) GST INC

\$45

FA 411 10/100 Mbps PC Card (Without dongle)



(B9944) GST INC

\$129

FA511 10/100 CardBus PC Card (without dongle) (D4112) GST INC

\$139



Ask About...



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Web: www.ht.com.au

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Fax: 1300 13 6666

Email: sales@ht.com.au

DEC
27

Networking & Communications Converged



11MBPS 802.11B WIRELESS LAN NETWORKING

1. **NP7000** - WireLess LAN AccessPoint with 40-bit WEP data encryption, auto fallback data rates and 10Base-T Ethernet interface. (D4196) GST Inc: **\$675**
2. **NP7020** - WireLess LAN PCI Adaptor card with 40-bit & 128-bit WEP data encryption, dual diversity antenna, type II PCMCIA interface. (D4197) GST Inc: **\$119**
3. **NP7030** - WireLess LAN PCMCIA adaptor with 40-bit & 128-bit WEP data encryption, dual diversity antenna, type II PCMCIA interface. (D4198) GST Inc: **\$349**
4. **NP7040** - WireLess LAN USB Adaptor with 40-bit WEP data encryption and 12Mbps data rate USB interface. (D4199) GST Inc: **\$399**
5. **NP7050** - WireLess LAN Compact Flash Adaptor for PDA's with 40-bit WEP data encryption and PCMCIA adaptor. (D4200) GST Inc: **\$449**

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NETWORK SWITCHES

1. **NP2005** - 5 Port 10/100Mbps Auto-sensing Network SmartSwitch, Intelligent 'Store & Forward Technology', Durable mini metal case, external plug-pack. (D0966) GST Inc: **\$139**
2. **NP2008** - 8 Port 10/100Mbps Auto-sensing Network SmartSwitch, Intelligent 'Store & Forward Technology', Durable mini metal case, external plug-pack. (D0967) GST Inc: **\$199**
3. **NP2080** - 8 Port 10/100Mbps Auto-sensing High-Performance Network ProSwitch, Intelligent 'Store & Forward Technology', Universal 240volt power supply. (D0968) GST Inc: **\$229**



Netcomm's Smart i-Share modem (SM4200) Winner of the PC Authority Quality Award!



INTERNET GATEWAY/ROUTER/FIREWALL/HUB

1. **SM4300** - SmartAccess Broadband/Cable Internet Gateway featuring Router, Firewall, WAN & Serial ports plus 4 port 10Base-T network hub. (C5432) GST Inc: **\$359**
2. **SM4200** - Smart-I-Share 56 Internet sharing Gateway featuring Router, Firewall, Built-in 56K V.90 Modem, Serial port plus 4 port 10Base-T network hub. (A8868) GST Inc: **\$454**



NETWORK INTERFACE ADAPTORS

1. **NP1100** - High performance auto-sensing 32bit 10/100Mbps Fast Ethernet PCI LAN adaptor featuring Wake-On-LAN function. (C7657) GST Inc: **\$33**
2. **NP1200** - 10/100Mbps Fast Ethernet 32bit PC Card with TruConnect technology, direct LAN connection, no dongle required. (D1166) GST Inc: **\$99**
3. **NP1010** - USB LAN Key 10/100Mbps Fast Ethernet adaptor connects PC's to LAN via a USB port with no need to reboot. (C7651) GST Inc: **\$88**
4. **NP1300** - Compact Flash 10Base-T Ethernet adaptor for PDA's and Notebooks includes PCMCIA adaptor. (D4201) GST Inc: **\$139**

Surround Yourself With The Very Best

Cordless Freedom™ Optical



The ultimate cordless keyboard and optical mouse. This striking combination is cordless for less clutter, more style and more freedom. Seamlessly access and navigate the Internet at the touch of a button or the scroll of the iNav wheel. Intuitive multimedia controls are at your fingertips and allow you to control MP3s, DVDs and CDs from your keyboard. Every keystroke is made easy with Zero Degree Tilt, offering one of the slimmest keyframes available. Logitech's patented digital cordless radio technology is encrypted to secure your privacy. The included Cordless MouseMan® Optical will perform perfectly for years to come. 5-year warranty.



optical

(C6106) GST Inc: **\$199**

WingMan® Force 3D



Feel the action in your games. This force feedback joystick lets you feel weapon recoils, explosions, and much more. The space-saving design takes up minimal room on your desktop. Includes a twist handle function, seven programmable buttons, 8-way hat switch, and high-precision throttle. Requires USB connection.



(A4998) GST Inc:

\$124

MouseMan Traveller

(D4014) GST Inc:

\$114



Cordless MouseMan Optical

(C1186) GST Inc:

\$129



TrackMan Live!

(77753) GST Inc:

\$285



Optical Mouse

(B9948) GST Inc:

\$49



Internet Navigator

(D0560) GST Inc:

\$65



Deluxe Access 104

(B0819) GST Inc:

\$38



WingMan Formula GP



Precision racing wheel with realistic pedals. Includes rubber hand grips, two wheel-mounted gear shifters, four programmable buttons and a dual clamping system. Requires USB.



(A7062) GST Inc: **\$124**

Cordless Freedom



Enjoy complete control and reliable performance, without cords that catch or tangle. Access the Internet, open e-mail, search or launch applications with one touch of a key. Includes Logitech Cordless Mouse. 3-year warranty.

NEW

(D3991) GST Inc: **\$129**



ClickSmart™ 310



Logitech's affordable mobile Internet camera offers unsurpassed ease of use. Capture up to 160 pictures, then transfer them easily to your computer. Record video clips or chat face to face with friends and family. 2-year warranty.

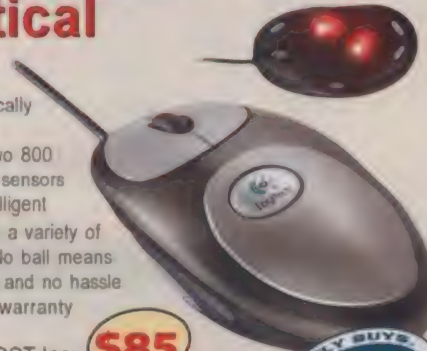


(D3583) GST Inc: **\$179**

NEW

MouseMan® Dual Optical

The technologically advanced mouse. Two 800 dpi optical sensors deliver intelligent tracking on a variety of surfaces. No ball means no sticking and no hassle. Five-year warranty.



(D4013) GST Inc: **\$85**

optical



Verbatim

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Digital Memory & Readers

PRETEC CompactFlash



With CompactFlash Digital Film you can increase the storage capacity of any compatible digital camera or PDA.

16MB CompactFlash	(B2920)	GST Inc:	\$45
32MB CompactFlash	(B2921)	GST Inc:	\$75
64MB CompactFlash	(B2922)	GST Inc:	\$119
128MB CompactFlash	(B2923)	GST Inc:	\$219

PRETEC SmartMedia



SmartMedia cards expand the storage capacity of any compatible digital camera. Suitable for digital cameras from Olympus, Fuji and others.

8MB SmartMedia	(B2914)	GST Inc:	\$35
16MB SmartMedia	(B2915)	GST Inc:	\$45
32MB SmartMedia	(B2916)	GST Inc:	\$69
64MB SmartMedia	(B2917)	GST Inc:	\$129
128MB SmartMedia	(C3680)	GST Inc:	\$285
SmartMedia Card Adapter	(B2918)	GST Inc:	\$99

PRETEC MultiMediaCard



MultiMediaCard is the world's smallest removable flash storage card! Suitable for MP3 players, Mobile phones and Digital Video Cameras.

16MB MultiMediaCard	(B9871)	GST Inc:	\$69
32MB MultiMediaCard	(B9873)	GST Inc:	\$99
64MB MultiMediaCard	(B9878)	GST Inc:	\$205

PRETEC Secure Digital Cards



Secure Digital media features faster data transfer rates and the ability to manually write-protect data.

16MB SecureDigital	(D4115)	GST Inc:	\$89
32MB SecureDigital	(D4116)	GST Inc:	\$143
64MB SecureDigital	(D4117)	GST Inc:	\$248

Memory Card Adapters



SDMCA PC Card 4-in-1 Card Adapter
(D4139) GST Inc: **\$119**

CFCA PC Card CompactFlash Card Adapter
(C2422) GST Inc: **\$22**

CFCAP PC Card Compact Flash+ Card Adapter
(D4147) GST Inc: **\$33**

SMCA PC Card SmartMedia Card Adapter
(B2918) GST Inc: **\$99**

USB Digital Memory Readers

Exchange data between your PC, laptop, MP3 player or Digital Camera.



UISDMC1 USB 4-in-1 Socket + Compact Flash Card Drive
(D4155) GST Inc: **\$165**

UISC3 USB SmartMedia and CompactFlash Card Drive
(B2926) GST Inc: **\$95**

4-in-1 Readers

4-in-1 readers have a unique single socket which will take Secure Digital card, MultiMediaCard, Memory Stick and SmartMedia.

Fire Wire Digital Memory Readers



POCFW
POSMFW
MIMKFW

FireWire CompactFlash Card Drive
FireWire SmartMedia Card Drive
FireWire Memory Stick Card Drive

(D4161) GST Inc: **\$109**
(D4162) GST Inc: **\$138**
(D4163) GST Inc: **\$148**

Verbatim

Slim-line PC Card CD-ROM Drive

"Add a CD-ROM to your Laptop!"



This 24x CD-ROM drive will connect to any PC Card enabled PC or Notebook & is ideal for mobile computing.

(97766)
GST Inc: **\$328**

DVD8X

• PC Card Portable
8x DVD-ROM drive

(B2931)
GST Inc: **\$660**

CDRW4X

• PC Card Portable
4x4x20 CD-RW drive

(C7205)
GST Inc: **\$530**

PCI Cards

Add super fast serial and parallel port interfaces to any PCI equipped PC.

(90688)
Priced from
GST Inc: **\$77**



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Copy discs with a single button press.
Standalone - no PC required.



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100 FREE* DISCS

8x4x32 (B2904) GST Inc: **\$990**

Rent* \$10.85/wk

16x10x40 (B9843) GST Inc: **\$1,489**

Rent* \$16.32/wk

*ON REDEMPTION:

Bonus CD's sent after registration of goods: registration form in boxes. Only available while stocks last.

KOUWELL IK


PCI Firewire Cards

Connect your digital video camera to your PC. Download and edit your own movies.



PCI Firewire Card - 4 ports	(90689) GST Inc: \$109
PCI Firewire Card - 6 ports	(A5161) GST Inc: \$143
PCI Firewire Repeater Card - 5 port	(A5162) GST Inc: \$118
PCI Firewire Repeater - 6 port	(A5163) GST Inc: \$154
PCI Firewire Repeater - 10 port	(A5164) GST Inc: \$205
6 pin to 6 pin Firewire cable	(B2905) GST Inc: \$14

KOUWELL IK

USB Hubs & Cards



USB Hub - 6 ports	(79702) GST Inc: \$89
PCI USB Card - 2 ports	(84801) GST Inc: \$44
USB Network Cable	(B2908) GST Inc: \$75
USB to Printer Cable	(84803) GST Inc: \$33
Internal 3.5" USB Hub - 4 ports	(B2909) GST Inc: \$65
USB to 10/100 Ethernet Adapter	(B2912) GST Inc: \$115

FireWire for Notebook



Adds two FireWire ports to your Notebook with a Cardbus Type II interface.

- Plug and Play!
- Free video capture and editing software.

FireWire to CardBus controller (2 port)
(B9849) GST Inc: **\$118**

KOUWELL IK **PCI SCSI Cards**


NEW 160MB Card

The easy way to expand your PC. Connect multiple SCSI devices to one card.

PCI Bus, Ultra-SCSI	(90681) GST Inc: \$97
PCI Bus, Ultra-Wide	(90683) GST Inc: \$175
PCI Bus, 2 channel Ultra-Wide	(90684) GST Inc: \$358
PCI Bus, Ultra2-Wide	(90685) GST Inc: \$245
PCI Bus, Ultra 160	(B9847) GST Inc: \$480

KOUWELL IK

IDE Acceleration & Expansion Card



Speed up your PC's new hard disk drives with this PCI plug in Ultra DMA 100 card. Supports transfer speeds of up to 100MB/s with new ATA100 drives, and includes the ability to run up to 4 extra IDE or ATAPI drives on your system.



PCI IDE Ultra DMA 100 Card	(90688) GST Inc: \$77
PCI IDE Ultra DMA 100 RAID Card	(B8410) GST Inc: \$110

USB 2.0



Introducing USB 2.0. Faster than FireWire. Compatible with existing USB peripherals.

5 port Card (B9850)
GST Inc: **\$139**

4 port Hub (B9851)
GST Inc: **\$139**

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Verbatim

RENTSMART

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Web Direct

www.ht.com.au/cat/verbatim

CD / DVD Production Equipment

PRIMERA
TECHNOLOGY INC.

Signature IV CD Printer



- 1200x1200 dpi res
- Fast: 27 seconds per disc.

(B9917) GST Inc:

\$3,298

Rent* \$32.34/wk

PRIMERA
TECHNOLOGY INC.

Signature Pro CD Printer



- 2400dpi
- Superfast
- Dual Ink Cartridges

(C3681) GST Inc:

\$4,069

Rent* \$38.02/wk

PRIMERA
TECHNOLOGY INC.

Inscripta Printer



- 610 x 305 dpi Thermal
- Durable finish

(B2932) GST Inc:

\$5,999

Rent* \$54.68/wk

PRIMERA
TECHNOLOGY INC.

Composer



Premastering software Included- optional inkjet printer shown

1 x CD-R

Composer CD-R 16x, 50 disc

(C5708) GST Inc: **\$5,435** Rent* \$49.54/wk

1 x DVD-R

Composer DVD-R 2x/8x, 50 disc

(c5561) GST Inc: **\$8,359** Rent* \$72.53/wk

2 x CD-R

ComposerPro CD-R 16x, 100 disc

(D4126) GST Inc: **\$8,375** Rent* \$72.66/wk

2 x DVD-R

ComposerPro DVD-R 2x/8x, 100 disc

(D4190) GST Inc: **\$13,095** Rent* \$107.27/wk



Add a printer from those shown at left and an adapter plate to upgrade your Composer/ComposerPro to a full burn and print solution.

Printer Stand for Inscripta Printer

(B8878) GST Inc: **\$110**

Printer Stand for Signature III/IV/Pro Printer

(C1748) GST Inc: **\$110**

Buzzsaw Network Burning Software

This unique software allows your Composer/ComposerPro to be networked in an office so that anyone can start up and monitor recording and printing jobs.

(D0538) GST Inc: **\$2,299**



Desktop Series

RIMAGE™

**NEW
RANGE**

Premastering network software included. Software developers kit also included.



1 x CD-R

Desktop 800 24x, 60 Disc

(D4141) GST Inc: **\$10,050** Rent* \$85.81/wk

1 x DVD-R

Desktop 800 2x/8x, 60 Disc

(D4148) GST Inc: **\$11,854** Rent* \$97.11/wk

2 x CD-R

Desktop 1000 24x, 50 disc

(D4143) GST Inc: **\$17,110** Rent* \$138.19/wk

Desktop 4000 24x, 50 disc

(optional 110 disc)

(D4144) GST Inc: **\$20,820** Rent* \$168.16/wk

2 x DVD-R

Desktop 1000 2x/8x, 50 disc

(D4151) GST Inc: **\$20,409** Rent* \$164.84/wk

Desktop 4000 2x/8x, 50 disc

(optional 110 disc)

(D4152) GST Inc: **\$23,707** Rent* \$191.47/wk

4 x CD-R

Desktop 4000 24x, 50 disc

(D4145) GST Inc: **\$22,264** Rent* \$179.82/wk

4 x DVD-R

Desktop 4000 2x/8x, 50 disc

(D4154) GST Inc: **\$28,036** Rent* \$226.44/wk

Unattended Copiers



MICROBOARDS
Technology, Inc.

Orbit 2 CD Duplicator

Stand Alone CD Duplicator with 1 16x CD-R drive. 50 CD Capacity. An internal CD-ROM Drive holds the master disc being duplicated.

"The Orbit II, aptly billed as "The Office Copier," is built to fit: it's easier to use than a fax machine, it occupies about the same space, and it comes at an alluring list price." Emedia Magazine

Orbit 2 CD Duplicator (B9918) GST Inc: **\$7,215** Rent* \$62.60/wk



NEW



Orbit 2 DVD Duplicator (D4191) GST Inc: **\$9,260** Rent* \$79.06/wk
• 2x DVD-R • 8x CD-R

DEC

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CD-R/CD-RW & DVD-R/DVD-RW: Storage for life

DataLifePlus CD-R 10 Pack



80 Min. 700MB
1x - 16x
10 Pack
(B4710) GST Inc: **\$16**

74 Min. 650MB
1x - 16x
10 pack
(B4329) GST Inc: **\$15**

DataLifePlus CD-R Audio



80 Min.
10 pack
recordable
(C7889) GST Inc: **\$22**

80 Min.
CD-R
(D0011) GST Inc: **\$3**

DataLifePlus CD-R - 24x



80 Min.
700MB
1x - 24x
10 Pack
(D4114) GST Inc: **\$16**

DataLifePlus Colours CD-R



80 Min. 700MB 1x - 12x
coloured CD-R's
in a 25 pack
(B1355) GST Inc: **\$35**

21 Min. SlimCase Pocket
Colours 16x 10Pack
(C9459) GST Inc: **\$21**

DataLifePlus CD-R - Singles

74 Min. 650MB 1x - 16x Singles



(74740) GST Inc: **\$2**

DataLife CD-R

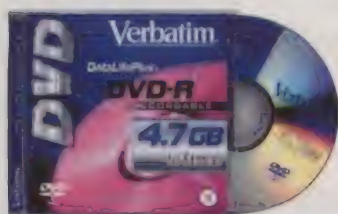
- Third generation Phthalocyanine Recording Dye Technology
- Scratch Resistant Surface



80 Minute DataLife SlimCase
10 pack 16x
(C7091) GST Inc: **\$13**

80 Minute DataLife Spindle
25 pack 16x
(C7093) GST Inc: **\$35**

DataLifePlus DVD-R & DVD-RW



4.7 GB DVD-R
for General Singles
(C8840) GST Inc: **\$21**

4.7 GB DVD-RW
(version 1.1)
(C8841) GST Inc: **\$42**

DataLifePlus CD-RW

650MB CD Rewritable 2x - 4x
20 pack in slimline cases



2x - 4x Singles
(77492) GST Inc: **\$4**

4x - 10x Singles
(B2658) GST Inc: **\$5**

Verbatim Digital Media CompactFlash



16MB (C8984)
GST Inc: **\$45**
32MB (C8986)
GST Inc: **\$75**
64MB (C8987)
GST Inc: **\$119**
128MB (D0020)
GST Inc: **\$219**

SmartMedia



16MB (C8989)
GST Inc: **\$45**
32MB (C8990)
GST Inc: **\$69**
64MB (C8991)
GST Inc: **\$129**

MultiMedia Card



16MB (C8994)
GST Inc: **\$69**
32MB (C8995)
GST Inc: **\$99**
64MB (C8996)
GST Inc: **\$205**

Diskettes

The world's No 1
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(79452) GST Inc: **\$6**

Verbatim DataLifePlus CD's represent the latest in technology. Featuring a proprietary blue Metal-Azo dye which has the best resistance to sunlight, silver reflective layer for optimum read and write performance and multispeed recording.

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Intel® Pocket Concert Audio Player

Enjoy up to four hours of big concert sound wherever you go with the high-output audio of the Intel® Pocket Concert™ Audio Player. Store up to four hours of music with 128MB of memory built-in. Big sound from an 11MW high-output audio amplifier. Less than 0.1% total harmonic distortion. • Wide frequency response of 20Hz-20,000Hz. FM radio with 10 programmable preset stations.

(C7142) GST Inc: **\$629**



Intel® Personal Audio Player 3000

Personalised look. Powered-up music. Experience up to 2 hours of solid, skip-free sound with the Intel® Personal Audio Player 3000. Design your own faceplates with the Intel® Faceplate Designer software. 64MB of built-in memory means two hours of quality music. The expandable memory slot gives virtually unlimited skip-free tunes. 6.5mW amplifier delivers clear, incredible sound. Supports MP3*, WMA* and future formats.

(D3944) GST Inc: **\$364**

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- Upgrade Return to Base of Warranty Extension to On-Site

Intel Play



Intel® Play™ QX3™ Plus Computer Microscope

Magnify objects up to 200X. Capture images, record video, add effects and share your discoveries. Collect and view, experiment and explore, then magnify and manipulate with the Intel® Play™ QX3™ Plus Computer Microscope. Rule the microscopic world with the Intel® Play™ QX3™ Plus Computer Microscope. Discover and explore the scientific world right at your PC with the Intel® Play™ QX3™ Plus Computer Microscope. Experience PC Play Power with the Intel® Play™ QX3™ Plus Computer Microscope.

(C6119) GST Inc: **\$229**



Intel® Play Computer Sound Morpher

Turn ordinary voices and sounds into one-of-a-kind creations with the Intel® Play™ Computer Sound Morpher. Mix and morph audio at your PC with dynamic multimedia software. Transform ordinary voices and sounds into wild and wacky creations with

the Intel® Play™ Computer Sound Morpher. Record and download, mix and morph, even animate and share one-of-a-kind sounds you create with the Intel® Play™ Computer Sound Morpher. Mix and morph everyday recorded sounds into one-of-a-kind, funky creations with the Intel® Play™ computer Sound Morpher. Experience PC Play Power with the Intel® Play™ Computer Sound Morpher.

(C7566) GST Inc: **\$69**

Intel PC Cameras



The Intel® Pro Video PC Camera

Import images and sound easily from your camcorder or VCR directly to your PC with the unique audio/video input plug. Create a PC movie with new or existing footage. Then upload and stream your video via the Internet to share with friends and family. Broadcast live over the Internet or set up a Webcam. Includes built-in microphone. Includes 10MB of free space for your online photo album. Make live, face-to-face video calls from your PC.

(C3605) GST Inc: **\$163**



The Intel® Home PC Camera

Is a great way for your family to take pictures and video and share them over the Internet. Includes a microphone, high-quality lens and extra software, so you can make video phone calls, set up a Webcam, broadcast live and more. High-quality pictures with 640 x 480 resolution. Make live, face-to-face video calls from your PC. Set up a Webcam to broadcast live over the Internet. Includes microphone. Includes 10MB of free space for your online video album.

(D3946) GST Inc: **\$168**



Intel® Play™ Digital Movie Creator

Call the action and direct your own movies with the Intel® Play™ Digital Movie Creator. Direct and record, edit and animate, then premiere and share your movies with the Intel® Play™ Digital Movie Creator. Direct your own original digital-quality movies on location or right at your PC with the Intel® Play™ Digital Movie Creator. Make movies like they do in Hollywood with the Intel® Play™ Digital Movie Creator. Experience PC Play Power with the Intel® Play™ Digital Movie Creator.

(D4010) GST Inc: **\$247**



The Intel® Pocket Digital PC Camera

Enjoy advanced digital camera features: 1.3 Mega-pixel pictures, built-in flash and expandable memory plus Webcam capabilities. Includes 16MB of memory so you can take 256 VGA digital pictures (640 x 480), 96 XGA pictures (1024 x 768) or 14 1.3 Mega-pixel pictures (1280 x 960). Add memory with Smart Media cards. Take snapshots day or night with built-in flash. Create 360-degree panoramic views and more. Set up a Webcam or broadcast live over the Internet.

(D3990) GST Inc: **\$389**



Collect 500 Bonus Fly Buys points when you purchase C7142, C6119, C3605, D3946, D3944, C7566, D4010, D3990 between 20/11/01 - 31/12/01

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CAMEDIA C-100

Affordable and easy to use

1.3 Megapixel CCD • Focus Free lens • 2x Digital tele-function • Motion JPEG image recording • Panorama function • Uses SmartMedia cards • USB AutoConnect interface for download.



(C5866) GST Inc: **\$495**

CAMEDIA C-700

Unbelievably compact 10x zoom

2.1 Megapixel CCD • 10x Optical zoom lens • 2.7x Digital zoom • Uses SmartMedia cards • USB AutoConnect • LCD viewfinder and monitor • Motion JPEG Image and Sound recording • Slide-Show and Picture Effects modes



(C5851) GST Inc: **\$1,649**

CAMEDIA C-200ZOOM

Portable digital zoom

2.1 Megapixel CCD • 3x optical zoom • Uses SmartMedia cards • Easy arrow key operation • Motion JPEG • USB AutoConnect • Quick sequence shooting (Up to 1.8 frames per second)



(D4208) GST Inc: **\$999RRP**

CAMEDIA C-40ZOOM

Pocket-sized digital zoom

4.0 Megapixel CCD • Bright 2.8x Optical zoom • Uses SmartMedia cards • Motion JPEG image and sound • Range of flash and creative controls • USB AutoConnect • Compact size (87 x 68.5 x 43.5 mm) • Ultra light weight.



(D4207) GST Inc: **\$Call**



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Powerful 2D/3D Video Graphics Card

MATROX MILLENNIUM G550

The Matrox G550 graphics card series comes standard with 32 MB of Double Data Rate (DDR) memory, a 360 MHz primary RAMDAC, and a unique HeadCasting Engine accelerating 3D online communication.

The Millennium G550 is a titan among graphics cards with trendsetting appeal for the business and home entertainment markets. Comprising an extensive feature set including third-generation DualHead® display capabilities, outstanding 2D performance, and DVI - I support, the Millennium G550 delivers exceptional graphics performance and product stability and ignites a new trend in online communication.

KEY FEATURES:

- Matrox G550 chip
- 32 MB high-speed Double Data Rate (DDR) memory
- UltraSharp 360 MHz RAMDAC
- Explosive Windows desktop acceleration
- HeadCasting Engine for hardware-accelerated 3D facial animation
- Bundled HeadCasting software for 3D communication
- True multi-display support under the Microsoft® Windows® 2000 operating system
- Third-generation DualHead® technology including eDualHead browser enhancements

G55+MDHA32DB Matrox G550 32Mb Single DVI output, Dual Head display
G55+MADDA32DB Matrox G550 32Mb Dual DVI output, Dual Head display
G55+MDHA32DR Matrox G550 32Mb Single DVI output, Dual Head display
G45+MVTA32DRI Matrox G450 32Mb Dual Head display

OEM (C7873) GST INC. **\$305**
 OEM (C7874) GST INC. **\$335**
 RETAIL (C7875) GST INC. **\$345**
 RETAIL (C0016) GST INC. **\$675**

Marvel G450e TV (PAL) 32Mb DDR inc Matrox PC-VCR and Matrox DVD Inc Ulead Videostudio 4.0 and Ulead Photo Explorer 6.0



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CM615
17" General Purpose CRT Monitor
1024x768@85Hz
0.24mm Horizontal Dot Pitch
(97802) GST Inc: **\$459**

NEW - CM721
19" Flat CRT Monitor - 1600x1200@75Hz
0.20mm Horizontal Dot Pitch
(C8839) GST Inc: **\$859**



NEW - CM621
17" Flat CRT Monitor
1024x768@85Hz
0.22mm Horizontal Dot Pitch
(C9156) GST Inc: **\$629**



CM715
19" General Purpose CRT Monitor
1600x1200@75Hz - 0.22mm Horizontal Dot Pitch
(97803) GST Inc: **\$769**



NEW - CM828
21" Performance CRT Monitor
1920x1440@75Hz - 0.21mm Horizontal Dot Pitch
(C9157) GST Inc: **\$1,899**



NEW - CM823
21" Flat CRT Monitor
2048x1536@75Hz
0.21mm Horizontal Dot Pitch
(C9158) GST Inc: **\$2,099**



CMP205SX
25" Plasma Display - SXGA (1280x1024)
(68323) GST Inc: **\$10,409**



CMP307XU
37" 4:3 XGA Plasma Display
1024x768
0.735MM Pixel Pitch
(A9663) GST Inc: **\$21,995**

CP-S220 LCD PROJECTOR



- SVGA 800 ANSI Lumen
- Ultra-Slim Unit (only 60mm high)
- Light Weight (only 2.4kg)
- Low-noise operation (34dB)
- Short Throw Distance - ensures large images even in limited spaces

(A9731) GST Inc: **\$5,299**

*Free Carry Bag comes bundled with Projector



CML170SXW
17" TFT LCD Monitor
with Speakers - SXGA
1280x1024@85Hz

(B3051) GST Inc: **\$1,895**



CML181SXW
18" TFT LCD Monitor
with Speakers - SXGA
1280x1024@85Hz

(D4273) GST Inc: **\$3,695** **RRP**

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High-breed Monitors

Samsung 151s 15" LCD monitor white 15 inch monitor



Specifications

- Resolution XGA(1024 x 768)
- Colors 16.7M
- H.Frequency 30 ~ 70 kHz
- V.Frequency 56 ~ 85 Hz
- Contrast 330:1
- Luminance 200cd/m2
- Viewing Angle 60o 140o/120o
- Video Input RGB,CVBS,S-Video,(Antenna/cable,YPbPr)
- Sync Type Separate,Composite,SOG
- TV Tuner(optional) NTSC,PAL
- Speaker 3W/ch x 2(Built-in)
- Power 40W(Max.)

(D3614) GST Inc: **\$989**

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SyncMaster 753dfx 17 inch monitor



SOHO Series Features:

Flatter images are easier on the eyes and slimmer products save on space and make users comfortable in their working environment. That's real value. And that's also what makes Samsung the World's Number 1 Monitor manufacturer.

Specifications

- 17"(16" Viewable)
- 0.20mm dot pitch (horizontal)
- 1280 x 1024 @ 66Hz Maximum Resolution
- DynaFlat - Infinitely Flat Tube
- Smart III surface treatment (anti-static & anti-glare)
- On Screen Digital Display
- Plug & Play Compatibility
- MPR-II/NUTEK certified

(C1283) GST Inc: **\$549**

Ask About...



- ☐ Extend to a total of 3 Years Return to Base
- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site

SyncMaster 955df 19 inch monitor



Graphix Pro Series Features:

Samsung continues to spearhead the monitor market in meeting customer's needs, built on its reputation as a leading provider of the highest quality monitors utilising the latest technologies to develop products to meet customers demands. Samsung's commitment to customer satisfaction and leadership in the monitor industry has been proven by the value that Samsung monitors provide its customers.

Specifications

- Model No.: 955df 19" (18" Viewable)
- 0.20mm dot pitch (Horizontal)
- 1600 x 1200 @68Hz Maximum Resolution
- DYNA Flat - Infinitely Flat Tube
- Smart III Surface Treatment (Anti-Static & Anti-Glare)
- Onscreen Digital Display
- MPR-II/NUTEK Certified
- Plug & Play Capability

(C3975) GST Inc: **\$964**

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Image Capturing Device

RDC-i500

NEW

Enjoy Top Resolution And Flexibility

The 3.34-megapixel CCD delivers photo quality resolution of 2048 x 1536 pixels. The 3x optical zoom lens is equivalent to 35-105mm on a 35mm film camera. This gives the flexibility you need in almost any shooting situation and because its optical, the zoom maintains sharp resolution across its range.



**CAPLIO
RR-10
NEW!!!**



- 3.34- megapixel resolution
- 3X optical zoom
- One-centimetre macro
- Text motion and voicemail, and annotation modes

(C7863) GST Inc:

\$1,899

Email without PC
or Notebook using the
Bonus* Pretec Compact
Flash Modem Card

*Bonus card included in the
package- only available from
01/12/01 to 31/12/01 or while
stocks last.

(C7872) GST Inc: **\$999**

MAJOR FEATURES:

- Micro-sized 2.1 megapixel digital camera
- Ricoh Base for one touch file transfer
- 2x Optical (38-76mm) all glass zoom lens
- 2x Digital zoom
- 8MB SD Memory card included
- LCD monitor
- MP3 AUDIO Playback
- USB compatible
- Incl software, ac adapter, lithium ion battery etc

DVD+RW DVD BURNER

FOUR-IN-ONE POWER

- **Writing speed**
(DVD+RW) 2.4x (CD-R) 2x, 4x, 8x, 12x(CD-RW) 2x, 4x, 10x*2
- **Reading speed**
(DVD-ROM/DVD+RW) Max. 8x(CD-ROM/CD-R/CD-RW) Max. 32x. Average access time (DVD) 140 msec. (8x) (CD) 120 msec. (32x)
- **Data transfer speed**
(at I / F) Max. 33MB/sec. (Ultra DMA Mode2)

(D1844) GST Inc: **\$1,495**

- **Writing mode**
(DVD+RW) Random Access Write, Sequential Write
- (CD-R/RW) Disc At Once, Session At once*3, Track At Once, Multi-Session, Packet Write
- **Writing format (DVD+RW)** DVD-ROM, DVD-Video, Random Access Write (CD-R/RW) CD-DA, CD-ROM, CD-ROM XA, CD Extra, CD-i*3, Mixed-ModeCD, VideoCD, PhotoCD*3, CD TEXT, Bootable CD

MP5120A

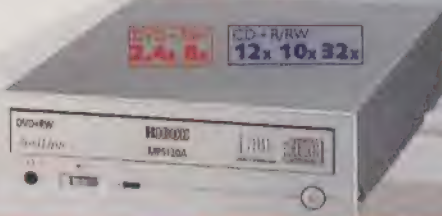
- 20x Record
- 10x ReWrite
- 40x Read
- 12x DVD Read
- 2MB Buffer
- Internal Type ATAPI
- S/PDIF terminal for digital audio output
- Anti-dust, low power consumption design
- B's Recorder GOLD - Mastering software

MP9200A

included:

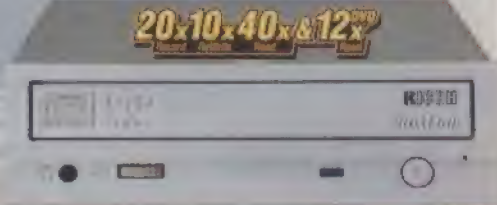
- B's Clip - UDF packet writing software
- Drag 'n Drop CD - Writing software
- WinDVD - DVD Video playback software included
- Ricoh CD-R & CD-RW disc
- Setup Manual
- One Year Ricoh Australia Warranty

(C7876) GST Inc: **\$580**



*2 10x speed CD-RW writing requires High Speed CD-RW media, and DVD-RAM media

*3 Bundled software does not support this feature



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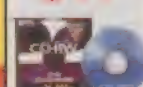
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Media
High
Speed
High
Quality**



(C7877)
GST Inc:
\$19



(C7878)
GST Inc:
\$17



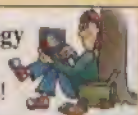
(74418)
GST Inc:
\$7

**DEC
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Smart Storage Solutions

Network Attached Storage

NAS 160GB

iomega® NAS 160GB servers, with Windows 2000 technology and multiple high-speed interfaces Ethernet and Ultra 160 SCSI. Includes free 20-seat license for QuikSync™ 3 automatic client backup software.



NAS 160GB

(C5567) GST Inc:

\$8,275

NAS 320GB

iomega serves up performance! iomega® NAS 320GB servers, with Windows® 2000 technology and multiple high-speed interfaces for 10/100 and Gigabit Ethernet and Ultra 160 SCSI. Includes free 50-seat license for QuikSync™ 3 automatic client backup software.



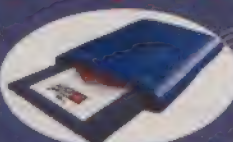
NAS 320GB

(C5568) GST Inc:

\$11,775

An affordable total storage solution as easy to use, but far superior to, the floppy drive

iomega's Zip® 100MB USB Powered drive is affordable, reliable, easy to use and has a sleek, durable design powered through the USB cable for complete plug-and-play compatibility.



(D0587) GST Inc:

\$190

Peerless

The next generation in high-capacity removable storage. iomega's Peerless™ drive system offers 10GB and 20GB disks, interchangeable interfaces, and 15MB/sec transfer rates for stunning performance. Firewire® and USB 1.1 interfaces available.



(C3525) GST Inc:

\$889



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Predator iomega Predator CD-RW drive

iomega® Predator™ Firewire (8x4x32) drive

Announcing the latest addition to the hottest looking external CDRW in the iomega range - the new Predator with Firewire connection. PC and Mac compatible, the new Predator Firewire allows true drive speed of 8x4x32, and provides versatility with interchangeable USB & PCMCIA adapters.

Predator™ USB iomega CD-RW External

(B4416) GST Inc:

\$565



Predator™ Firewire 8x4x32

(C2413) GST Inc:

\$685



Zip 100MB
disk: (23772)
GST Inc: **\$25**

10-pack:
(21889) GST Inc:
\$189

Zip drive carry
case (31823)
GST Inc: **\$49**
Zip SCSI
cable (46304)
GST Inc:
\$35

Zip disk labels
20-pack (48059)
GST Inc: **\$5**

Jaz 2GB
External Drive
(A4022) GST Inc:
\$785

Jaz 2GB disk
(61652) GST Inc:
\$205

Jaz 2GB 3-
pack (57271)
GST Inc:
\$615

Jaz 1GB disk
(24218) GST Inc:
\$199

Jaz 1GB 3-
pack (32844)
GST Inc:
\$589

iomega CD-RW

CD-RW Drive



USB 2.0 capability gives iomega's new external CD-RW drive amazing 16x10x40x performance with PCs that support the USB 2.0 standard. Also fully backward compatible with USB 1.1, providing near-universal connectivity with Mac and PC computers and 4x4x6x performance. Includes Buffer Under-run protection and NEW iomega HotBurn CD creation software.

(D4043) GST Inc:

\$500

Host Powered 250 USB

NEW - Host-powered Zip® 250MB USB drive Now it's even easier to take your information with you. The Zip® 250 USB drive is now available with a USB cable that provides both data and power, so you don't need any external power source. It's easy to connect (just plug it in) and easy to launch (no rebooting)! This new drive is compatible with most major operating systems and all Zip 100MB and 250MB Zip disks.



Host powered 250 USB Ext

(B6404) GST Inc:

\$365

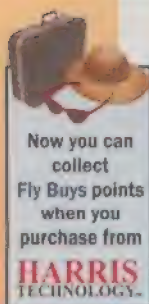


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CD-R/W & Caching Towers



PLEXTOR® PlexWriter
24/10/40A E-IDE
\$619

(C7688) GST Inc:

Rent* \$6.78/wk

High speed – Fastest in the world. High Quality – New writing strategy – POWEREC II High Reliability – Save your disc – BURN Proof.

The PlexWriter 24/10/40A E-IDE (ATAPI) drive, with built-in BURN-Proof technology, delivers exceptionally fast performance in a professional 3-in-1 CD solution, while upholding the legendary Plextor reliability.

How does PowerRec-II function?

PowerRec-II checks the quality of a disc in order to set up the appropriate writing speed and optimised laser power for the disc. This technology promises, in Zone CLV, excellent writing in each area of the disc. The PlexWriter records CD-R discs at 24X speed, rewrites CD-RWs at 10X, and reads back all CDs at 40 speed. BURN Proof (Buffer Under Run - Proof) enables you to stop writing before buffer under run errors occur and then to continue writing by tying last point of recording and the next start point ... no more drink coasters. These drives are the best of the best. Comes with software, cables, manuals, ready for installation.

Wine on-line?



RENTSMART

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FOR MORE DETAILS

The figures quoted are based on a per week basis over 3 years. T.A.P. Terms & Conditions apply.

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery*
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Delivery charges extra.

PLEXTOR® Portable For Notebooks & PC's 8/8/24 USB

It's the first-ever portable slim CD-R/W drive from Plextor with 8 Speed writing and 8 Speed rewriting by full CLV technology with "BURN-Proof" and 24 speed reliable readying. The PX-88TU features USB 2.0 interface (maximum transfer rate of 480Mbps). The PX-88TU's unique see-through window enables easy identification of the disc inside the drive for both 12 and 8cm discs. All Plextor drives are supplied with:



- MVP 2000 Create a digital jukebox and customized play lists, Record audio CDs from the play list on CDR, Automated internet access to the CDDb database supplies album, song and artist information.
- Audio FS – allows for Drag & Drop access to any CD-Audio track as if they were .WAV files.
- Audio Capture 2000 - Drag & Drop tracks from standard audio CDs
- Plextor Manager 2000 utility software
- Disc Dupe 2000 – Duplicate your own CDs

(D0372) GST Inc:

\$799

Rent* \$8.75/wk

OPTISTOR®

Advanced CD caching technology!

How to put up to 254 CD's into 1 convenient central 5 bay CD tower

The market leading CD tower offers fast and simple sharing of CD (and DVDs) on your network. New caching technology enables you to quickly store 100's of CD's onto a built-in fast hard disk within the tower. With the new optional CD-R/W feature, the CD tower can also feature 'writing to CD' across the network.

- Axis technology at the heart of the CD Tower
- NEW optional CD-R/W function enables you to burn to CD across the network
- True plug n play NAS device - The Optistor CD tower can be plugged in anywhere
- In built web server for easy web browser management

(B6595) GST Inc:

FROM \$3,225

Rent* \$31.62/wk

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Jackson

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Retractable Extension lead RJ45 to RJ45

NEW

Networking Cable - Category 5 LAN Cable UTP. Suitable for connecting computers to networks

- Spring loaded auto-retracting cable
- RJ45 to RJ45 - eight conductors
- Max. length 2.5 metres.

RJ45 (D0567) GST Inc: **\$56**

Retractable Extension lead

NEW

This product extends your telephone, fax machine, modem, answering machine etc. up to 2.5 metres away from the existing telephone modular socket. Perfect for the laptop computer when you are on the move

- Spring loaded auto retracting cable.
- RJ12 to RJ12 - four conductor.
- Max. length 2.5 metres.

RJ12 (C2512) GST Inc: **\$29**

Jackson Dual Surge Protector

NEW

Ideal for Laptop and Modem, or any use where you need two 20VAC Protected outlets.
• use RJ12 or RJ45 connectors
Suitable for:
Internet, modem, computers, laptops, answering machines, callerID, cordless telephones, fax machines etc

(D0566) GST Inc: **\$49**

Jackson 4 way phone line switch

NEW

Designed specifically for net users and people that have faxes, phones, modems etc, but don't have lines to use them all at once. You can switch between one device like a modem. No more waiting for a free line before connecting to the net.

(D0568) GST Inc: **\$69**

Jackson

Figure 8
Style Inline
Surge
Protector
(B8350) GST
INC **\$34**

IEC Style
Inline Surge
Protector
(B8348) GST
INC **\$42**

Cloverleaf
Style Inline
Surge
Protector
(B8351) GST
INC **\$42**

Single Power
Surge
Protector
(B8368) GST
INC **\$32**

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COMMUNICATIONS

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Swann. More than modems!

SWANN SPEED DEMON

56K V.90 External Voice/Fax/Data Modem

- New graphite version!
- Great value for money
- Bonus Telstra '100 hours' Internet Access CD
- Drivers and application CD included
- 1 year "Hassle Free" warranty

(B7970) GST INC **\$95**

SWANNFIRE CARDBUS

FireWire PCMCIA Card

- FireWire solution for laptops
- Data transfer speeds of up to 400Mbps
- Suitable for laptop users and travellers
- Allows "hot swapping"
- 1 year "Hassle Free" warranty

(C2307) GST INC **\$129**

SWANN USB MULTI-HUB

USB 4-Port Hub

- Easy and convenient access to USB ports
- Allows "Hot Swapping"
- PC & Mac compatible
- Supports bus-powered and self-powered USB peripherals (including printers, scanners, modems, keyboards and mice)
- 1 year "Hassle Free" warranty

(C6793) GST INC **\$55**

SWANN FIREWIRE® PRO DV KIT

Everything you need for easy and fun digital video editing

- Captures full screen video from your camera to your computer's hard drive with transfer speeds of up to 400Mbps
- Complete kit with FireWire PCI Card, software, bonus headset and FireWire 6pin-4pin cable
- 1 year "Hassle Free" warranty

(A1794) GST INC **\$189**

SWANN WIRELESS GUARDIAN

A/V Monitor and Camera

- Monitor children, your home or the workplace
- Completely wireless system for portability
- Infrared LEDs for night vision
- Battery or mains powered
- 1 year "Hassle Free" warranty

(C5593) GST INC **\$349**

SWANN MICROCAM

2.4GHz Wireless Ultra Miniature Camera System

- The ideal discreet security system
- Simple to install, just plug to any video device such as a VCR, TV or security monitor and play
- Superior quality CMOS colour lens
- Up to 100m transmission range
- 1 year "Hassle Free" warranty

COMPLETE DIY KIT (C5312) GST INC **\$599**

SWANNSMART
TURBO 56K
V.90 External
Voice/Fax/Data
Modem



(B1846) GST
INC **\$125**

SWANN USB
SMARTCAM
DELUXE USB
Web Cam



(C6794) GST
INC **\$69**

Swann also stocks a range of quality accessories for your Palm™ organiser, including our highly popular Screen Protectors, which protect your Palm™ from dust, moisture and scratches.

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Multimedia: DVD & Blank Media



Fast
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Pioneer DVD-A06SZ 16x SLOT LOADING DVD-ROM DRIVE UPGRADE KIT



DVR-A06SZ
(D1015) GST Inc:
\$195

FEATURES

- 16x for DVD, 40x for CD
- Ultra DMA66
- Super quiet mechanism
- Vertical or horizontal mounting

INCLUDES:

- Power DVD software decoder
- Mounting screws & audio cable
- Pioneer DVD-ROM Drive (2 year warranty)

**Includes: 5 x DVD
movie rental vouchers
from Blockbuster Video**
(Included inside product box -
see voucher for conditions
and expiry dates)



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Pioneer DVD DVR-A03 DVD-R/RW DRIVE

One drive...

One complete recording solution!

FEATURES

Writes: DVD-R (2x) DVD-RW (1x)
CD-R (8x) CD-RW (4x)

Reads: DVD-ROM, DVD-Video, DVD-R,
DVD-RW, CD-ROM, CD-R, CD-RW,
CD-TEXT, Photo CD, Audio CD

INCLUDES

- SONIC MyDVD Authoring Software
- PrimoDVD Writing Software by Veritas
- STAEDTLER LUMOCOLOR pen
- Power DVD software decoder
- 2 x DVD-R Media
- 5 x CD-R Media
- 1 x DVD-RW
- 5 x Blockbuster Video DVD movie rental vouchers.

DVR-A03 (C3847) GST Inc: **\$1,595**



Pioneer DVR-A03 PRO PACK

This is designed for the video enthusiast and contains all the same goodies as the DVR-A03 plus ReelDVD Professional Authoring Software (Version 2.5) by Sonic Solutions and "DVD Production and Authoring" book by Ralph La Barge (retail value over \$2,000 for these additions).

DVR-A03 PRO (D4247) GST Inc: **\$2,319**



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points!

Pioneer DVD-R MEDIA

• Jewel Case • Memory capacity of 4.7GB • Suitable for DVD Video & Data backup • Playable on both DVD-Video players & DVD-ROM drives • Commercial and Home DVD-Video production • Large sized data archive storage (not for use with Pioneer DVR-S201 authoring drive)



DVS-R470SDF (B9971) GST Inc: **\$22**

DVS-RP470SDF • White printable version (C2322) GST Inc: **\$26**

Pioneer DVD-RW MEDIA

Rewritable
DVD media

• Jewel case
• Memory capacity of 4.7GB: Suitable for DVD video & data (not for use with Pioneer DVR-S201 authoring drive)



DVS-RW470SD (C2326) GST Inc: **\$38**

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42

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Exceptional Value Printers & Scanners

THE LATEST! S300 COLOUR BUBBLE JET™ PRINTER

- Up to 11 black and white and 7.5 Colour pages per minute
- Up to 2400 x 1200dpi print resolution
- 5 picolitre MicroFine Droplet Technology for crisp text and realistic photos
- Cost saving separate black and tri-colour ink tanks
- Plug 'n play USB Interface for Windows and Mac (parallel not supported)
- Compact footprint - ideal for the home office
- Print driver with Photo Optimiser PRO, special effects, banner and poster printing

Colour lasts up to 25 years using Canon's Photo Paper Pro

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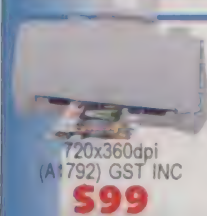
(D4023) GST INC **\$299**



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PRINTERS



720x360dpi
(A1792) GST INC
\$99

BJC-1000SP Bubble Jet Printer

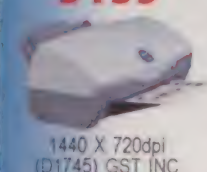
- Outstanding operating economy.
- Vivid colours, even on plain paper.
- Exceptional photographic quality.
- Automatic image improvement.
- Banner printing and outstanding versatility.



360x720dpi
(A3173) GST INC
\$139

BJC-2100SP Bubble Jet Printer

- New Super Economy mode cuts operating costs by up to 75%.
- High speed printing, up to 5 ppm black text and up to 2 ppm colour.
- Optional colour scanner.
- Now with parallel port.



1440 X 720dpi
(D1745) GST INC
\$235

S400SP Bubble Jet Printer

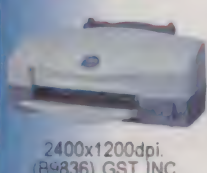
- Super-high resolution, up to 1440 x 720 dpi.
- Brilliant colour inks.
- Operating economy.
- Extraordinary photo printing.
- Optional colour scanner cartridge IS-32.



2400 X 1200dpi
(C4013) GST INC
\$489

S600 Bubble Jet Printer

- 8" x 10" photo in approx. 90 seconds
- Four individual ink tanks with low-ink sensor
- 2400 x 1200 dpi in color (38% greater than 2880 x 720 dpi)
- Advanced MicroFine Droplet Technology™ for photo-image quality
- Compatibility: Windows® 95/98/2000.



2400x1200dpi.
(B9836) GST INC
\$558

S800 Bubble Jet Printer

- Photo Lab printing for the desktop.
- Printing resolutions up to 2400 x 1200 dpi.
- Separate ink tanks for each colour
- Includes Photo Optimiser Pro and Photo Record image browser software.

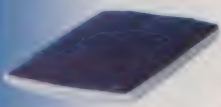


600x600dpi.
(C3917) GST INC
\$498

LBP810 Printer

- High resolution 600 dpi printing for crisp text and graphics.
- 8 ppm engine speed.
- Wide media compatibility, print transparencies, envelopes, postcards etc.
- Outstanding line definition - equivalent to 2400 dpi horizontally.
- Parallel & USB connections for wide compatibility.

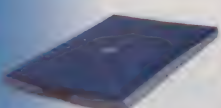
SCANNERS



600x1200 dpi
(D4026) GST INC
\$159

N640Pex Flatbed Scanner

- Optical resolution is 600 by 1200 dpi
- 42-bit input
- Only 4 cm tall
- Parallel interface
- Scans up to A4 size (Quite operation)
- Complete software package, LIDE Technology



600 x 1200 dpi.
(D1005) GST INC
\$185

N670U Flatbed Scanner

- One touch scan controls
- USB Interface
- 600 x 1200 dpi
- Scan, click and burn photos onto CD's.
- Advanced Z-Lid cover simplifies scanning of bulky items, books and magazines.



1200x2400dpi.
(C7589) GST INC
\$289

N1240U Flatbed Scanner

- Amazing 1200 x 2400dpi optical with selectable resolution up to 9600dpi
- Stylish charcoal and aluminium finish.
- New Z-lid for scanning thick books etc.
- Software for Windows & Mac including OmniPage and PhotoShop Elements.



1200x2400dpi.
(B9935) GST INC
\$389

CanoScan D1230U Flatbed Scanner

- A4 1200x2400dpi flatbed scanner - optional 1200x2400dpi film scanning.
- Fast one pass USB scanning.
- Stylish charcoal grey and aluminium design.
- Includes Adobe PhotoShop 5.0LE & OmniPage OCR software for Win. and Mac.



2400x4800dpi.
(B9840) GST INC
\$758

CanoScan D2400UF Flatbed Scanner

- Optical resolution of 2400 x 4800 dpi.
- Film adaptor lid - for accurate scanning of 35mm, 2 1/4" and 4"x5" film.
- Outstanding colour accuracy.
- Ideal for professional studios, graphics and design bureaux.

PowerShot
A10
DIGITAL CAMERA



(C3968)
GST INC
\$685

PowerShot
A20
DIGITAL CAMERA



(C3864)
GST INC
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PowerShot
DIGITAL
IXUS-V



(C5389)
GST INC
\$1,174

PowerShot
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IXUS 300



(C5653)
GST INC
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proofing
solution**



hp designjet 50ps

Professional solution A3+ graphics colour thermal inkjetprinter

hp designjet 20ps

Work group solution A3+ graphics colour thermal inkjetprinter

hp designjet 10ps

Personal Solution A3+ graphics colour thermal inkjetprinter

- RES: up to 2400x1200dpi
- SPEED: A3+ print outs can be generated at a super fast speed of up to 4 mpp
- INK: 6-ink modular cartridge systems with four 69ml (cmk) and two 28ml cartridges that help minimise printer down time and reduce cost per print
- RIP: stand alone or server based RIP optimises your system's resources
- PAPER: up to A3

Rent* /wk	Part #	GST Inc:
\$62.98	(C8933)	\$7,259
\$36.43	(C8932)	\$3,898
\$26.46	(C8931)	\$2,698

hp designjet 800

**Professional graphics printer
wide photo quality ads and graphics**



hp 800PS 42"

hp 800PS 24"

- RES: 2400x1200dpi
- SPEED: Line drawing prints times as short as 60 seconds (D size 24-36Inches)
Colour Image Fast: 7.9m²/hour Normal: 3.34m²/hour Best: 1.95m²/hour
- MEDIA: Coated & glossy paper, technical media. Sheet & roll feed, auto cutter
- SIZES: Sheet: 211mm - 1897mm ; Roll: 24" (w) x 45.7m (l)
- I/FACE: Parallel, USB
- SIZE: Printer in 2 sizes 42 or 24 Inches wide

Rent* /wk	Part #	GST Inc:
\$82.69	(B8514)	\$9,685
\$114.40	(B8518)	\$13,965
\$93.51	(B8513)	\$11,415
\$131.93	(B8519)	\$16,105

hp designjet 5000

**Professional graphics printer photo
quality unmatched by any other printer**

Come in & see one on display @ our Nth Ryde Location!



hp 5000PS 60"

hp 5000PS 42"

- RES: 1200x600dpi on glossy media (6 colours:CMYKcm)
- SPEED: max: 46.4 sq m²/hr, (42" dye/uv)
max: 52.9 sq m²/hr, (60-inch dye/uv)
- MEDIA: Coated & glossy paper, backlit, opaque, vinyl, canvas...
- SIZES: Sheet: 211mm- 914mm (w) x 559- 1600mm (l);
Roll: 24/36/42/54/60" (w), up to 91.4m (l)
- I/FACE: Parallel, hp JetDirect 610N 10/100 Base TX Print Server
- SIZE: Printer in 2 sizes 42 or 60 Inches wide

Rent* /wk	Part #	GST Inc:
\$158.38	(B6514)	\$19,610
\$208.02	(B9792)	\$25,755
\$252.61	(B6515)	\$31,275
-	(B9791)	\$38,580

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hp LaserJet printers

hp LaserJet 1000 Series

Designed for personal printing in entrepreneurial business, home business and telecommuters who challenged by multitude of printing needs, the hp LaserJet 1000 printer is a simple, low-cost, reliable laser printer for fundamental printing, delivering professional looking business documents every time.



- 10 ppm • hp exclusive instant-on fuser eliminates warm-up time; first page out in 15 seconds • USB port • 48 MHz RISC processor • 7,000 pages per-month duty cycle • 1 MB RAM memory, 32KB ROM memory.

hp LaserJet 1000 USB (C9361) GST INC **\$625**

hp LaserJet 1200 Series

hp LaserJet 1200 (base unit) (B9799) GST INC **\$785**
hp LaserJet 1200n-16MB (B9958) GST INC **\$1,295**

- 14 ppm A4 (best-in-class) and first page out in less than 10 seconds
- increased memory of 8MB of RAM (upgradable to 72 MB)
- protected 250-sheet input tray and 10-sheet priority feed tray
- improved 10,000 pages monthly duty cycle
- instant-on-fuser eliminates warm up time.



hp LaserJet 1220 (B9968) GST INC **\$925**

You can now enjoy the comfort of printing, colour scanning and copying from one machine with the copier/scanner attachment for your hp LaserJet 1200. Beside enjoying all the best-in-class printing capabilities of the hp LaserJet 1200, you can now take control of your document management with the added benefit of colour scanning and copying.

hp LaserJet 4550 Series



hp colour LaserJet 4550 A4 16PPM 64Mb (B2381) GST INC **\$3,974**

hp colour LaserJet 4550N A4 16PPM 64Mb 10/100 (B2382) GST INC **\$4,495**

hp LaserJet 2200 Series NEW PRODUCT

- Improved productivity with faster printing at 18 ppm A4 • best printing resolution of true 1200 x 1200dpi at full speed • quicker return to application with 133 MHz processor • first page out in 15 seconds with instant-on-fuser • print large and complex documents quickly and easily with 8 MB of standard memory (16 MB memory on hp LaserJet 2200dtn: - expandable up to 48 MB 2200D/DTN: memory expansion up to 72MB
- increased duty cycle to 40,000/month.
- LJ2200 model (no duplexer built in for double sided printing)



hp LaserJet 2200d (base unit) (B9956) GST INC **\$1,548**
hp LaserJet 2200dn (B9957) GST INC **\$2,045**
hp LaserJet 2200dtn (B9898) GST INC **\$2,585**

hp LaserJet 4100 Printer

- Super fast printing at 24ppm A4 print
- 250MHz processor ensures quicker return to application • complex documents print faster with 16MB/32MB memory • 12 second first page out • HP Pro-Res & FastRes 1200 dpi print quality at full speed • dynamic RIP- once for faster processing of multiple original prints • duty cycle of 150,000 pages/month



hp LaserJet 4100 (base unit) (B8399) GST INC **\$2,245**
hp LaserJet 4100n (B8400) GST INC **\$2,975**
hp LaserJet 4100tn (B8401) GST INC **\$3,459**
hp LaserJet 4100dtn (B8402) GST INC **\$3,990**

hp LaserJet 3200 Series

Printer, Fax, Copier & Scanner! An ideal business solution for small office, home office (SOHO), small/medium business and top level executives, the hp LaserJet 3200 series is four machines in one. Print, fax copy and scan from one machine and it only occupies 1.6 sq. ft. of your desk space!



hp LaserJet 3200 (C2332) GST INC **\$1,370**
hp LaserJet 3200M (C4456) GST INC **\$1,550**

hp LaserJet 8150 Series

The new HP LaserJet 8150 series is designed to grow with your business and its needs. It delivers high-volume, high-speed black and white prints and copies for small workgroups to large departments. • Fast printing at A4: 32 ppm; 32 MB RAM (expandable to 160 MB); 250MHz processor.



hp LaserJet 8150 (B1981) GST INC **\$4,378**
hp LaserJet 8150N (B1986) GST INC **\$5,098**
hp LaserJet 8150DN (B1982) GST INC **\$5,795**

Last Month be quick!

Trade-in your old printer upgrade to a new hp LaserJet now!

offer ends 21 December 2001

GO TO www.asiapac.hp.com/tradein/au/ to find full details & conditions.



hp officejets & deskjets

hp officejet T65

All In One Scanner/Printer/Fax/Copier

- Up to 11ppm mono and 8.5ppm colour
- 75 page memory
- Colour fax capability
- 100 speed dials with 10 one-touch keys
- junk fax barrier, 20 group speed dials fax forwarding
- Colour scanning - 300 x 600dpi optical, up to 1200dpi enhanced 24 bit colour
- walk-up colour copy.



(B4893) GST INC **\$339**

hp PSC 750

HOT
NEW PRODUCT

Printer-scanner-copier

Ideal for: Busy families that need convenience and quality Savvy users with limited work space
Students who want to get creative with cards, newsletters and more benefits: Make quick color copies at home from 3x5 inches up to 8.5 x 14 inches Scan your favorite snapshot to e-mail friends and family Print on photo paper to put in your photo album



(C7655) GST INC **\$649**

hp officejet K80

Ideal for: Photographers needing photo-quality prints on any paper Small offices looking to share faxing, copying, and printing responsibilities Office managers looking for a compact, cost-effective office solution

- Features**
- colour speed 10 ppm colour
 - black speed 12 ppm black
 - print technology HP Photo REt III technology (color layering technology)
 - scanner enhanced resolution 3600 dpi
 - scanner bit depth 36-bit A/D colour.



(B2081) GST INC **\$799**

hp officejet G85

All Colour; Printer, Copier, Scanner & Fax

Prints at up to 12 ppm black, 10 ppm color using HP photoREt 3 Precision Technology, 2400 x 1200dpi colour, as well as flatbed 36-bit scanning, faster copying speeds, and upgradeable networking capability which allows one unit to be shared by several PCs. Each model combines a color printer, scanner, copier and a walk-up color fax.



(A0062) GST INC **\$1,169**

hp deskjet 960c

HOT
NEW PRODUCT

HP's smart photo-quality colour printer

- HP™'s smart photo-quality colour printer premium photo quality
- get the best photo-quality with HP PhotoREt 3 colour layering technology
- up to 2400 x 1200 dpi
- prints up to 15 ppm black & 12 ppm colour
- 150-sheet paper tray



(D3918) GST INC **\$480**

hp deskjet 948

HOT
NEW PRODUCT

Explore your creativity and print photos easily with HP's premium photo-quality colour printer

- up to 2400 x 1200 dpi
- optional automatic two-sided printing
- space-saving fold-up paper tray
- best photo-quality with HP PhotoREt 3
- parallel and USB connectivity
- USB-connect Macintosh
- prints up to 12 ppm black and 10 ppm colour



(D3927) GST INC **\$385**

hp deskjet 845

HOT
NEW PRODUCT

Step up to HP's photo-quality printer that gives you true-to-original colours brilliant

- crisp black text and photo-quality images
- up to 600 x 1200 dpi
- no swapping ink cartridges to print outstanding photo-quality colour
- ideal for work and other creative projects
- prints up to 8 ppm black and 5 ppm colour
- USB connectivity for



(D3921) GST INC **\$189**

hp deskjet 656c

HOT
NEW PRODUCT

Add colours to your life with HP's easyand affordable colour printer

- HP reliability at a great price
- prints up to 6 ppm black and 3 ppm colour
- perfect for printing email, internet information and basic colour graphics
- compact with fold-up paper tray
- USB connectivity for PC



(D3922) GST INC **\$145**

Collect 1000 Bonus Fly Buys points when you purchase D3918, D3927, D3921, D3922 between 20/11/01 - 31/12/01

Ask About...



- Extend to a total of 3 Years Return to Base
- Extend to a total of 5 Years Return to Base
- Upgrade Return to Base of Warranty Extension to On-Site

hp scanjets & consumables

hp scanjet 4400

hp's exclusive scanning software automatically optimises scanned photos, converts black-and-white line art into infinitely scalable vector files and automatically creates editable text from scanned documents with a simple drag-and-drop, copy and paste or scan to. If you want the flexibility to adjust scanned images on your own, you can do that, too.



(C5904) GST INC **\$265**

hp scanjet 5470c

Superior scans at a touch High-performance, 2400 dpi scanner for professional use.

Image resolution up to 2400 dpi with true 48-bit colour • hp's exclusive dual sensor CCD (charge coupled device) technology brings you exceptional crisp and sharp scans up to 2400 dpi resolution • true 48-bit colour depth delivers true-to- original, colour-rich images • no compromise on speed with preview scans in as little as 8 seconds



(C7652) GST INC **\$545**



Collect 500 Bonus Fly Buys points when you purchase C5904, C7652, C5869, C7201, B9949 or C1561 between 20/11/01 - 31/12/01

colour scanners	scan speed	image quality	scanning software	Part No	Price
hp scanjet 2200	18 seconds	600 dpi optical	precisionscan LTX	(C5896)	GST INC \$174
hp scanjet 5400	08 seconds	2400 dpi optical	precisionscan pro 3.0	(C7201)	GST INC \$415
hp scanjet 7400	04 seconds	2400 dpi optical	precisionscan pro 3.0	(B9949)	GST INC \$979
hp scanjet 7450	04 seconds	2400 dpi optical	precisionscan pro 3.0	(C1561)	GST INC \$1,435

toner

paper

ink cartridges

hp Laserjet C7115A

Ultraprecise print cartridge for HP LaserJet 1200/1220 series
(C0936) GST INC **\$138**

hp C4096A HP LaserJet 2100/2200 Series

5,000 Page Toner
(73192) GST INC **\$210**

hp C4192A HP 4500

Cyan Toner Cartridge 6000 page
(70439) GST INC **\$257**
(cyan & magenta also available)

hp C4182X HP LaserJet 8100 Series 20,000

Page Toner
(70461) GST INC **\$385**

hp C4127X HP LaserJet 4000 Series 10,000

Page Toner
(54731) GST INC **\$259**

hp 10x15cm Premium Plus Photo Paper Glossy

- 20 Sheets
(84905) GST INC **\$19**

hp A4 Premium Plus Photo Paper Glossy

- 20 Sheets
(84904) GST INC **\$29**

hp A4 Premium Photo Paper - 15 sheets

(54010) GST INC **\$19**

hp A3 Premium Photo Paper Size - 20 Sheets

(58635) GST INC **\$59**

hp Iron On T-shirt Transfers A4 10 pages

(52818) GST INC **\$26**

hp HeavyWeight InkJet (European A4, 100 sheets)

(54009) GST INC **\$29**

No 29 Black inkjet Cartridge

(21919) GST INC **\$69**

No 78 Tri-Colour Inkjet print Cartridge

(86183) GST INC **\$79**

No 20 Black print Cartridge

(A3302) GST INC **\$59**

No10 Black Ink Cartridge

Designjet 500
(70165) GST INC **\$79**

No 45 Black inkjet Cartridge

(22643) GST INC **\$69**

No10 Magenta Ink Cartridge

(70167) GST INC **\$79**

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(at top of page) for all your HP ink & paper needs!



DEC

47

Take advantage of these great offers from Lexmark!

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DEC

48



Lexmark W820n Laser Printer

High-volume printing performance in a department printer.

- Fast 45 pages per minute (A4), powerful 350 MHz processor, and <7 seconds time to first page
- Integrated 10/100 Ethernet and USB ports Standard which means fast and easy host connectivity
- Standard 64MB of memory, expandable to 384MB to handle large print jobs, with up to 250,000-page duty cycle to handle high-volume printing environments
- 2 x 500 sheet input trays including Offset stacking in standard output with optional high-capacity input, duplexing, high-capacity finishing with multi-position stapling, and hole punch capability
- MarkVision provides proactive monitoring of printers and tracking of output for easy network management

plus

Purchase a W820n Laser Printer between 1st Dec and 21st Dec 2001 & get a T520 Lexmark Laser **FREE** (RRP value \$1,455)

(D3931) GST INC **\$7,357**

OR

get a duplex unit **FREE** (RRP value \$1,200)

(D3930) GST INC **\$7,357**



Lexmark X520 Laser Printer

Give yourself more time to grow your business!

- 19 page per minute
- Compact Design
- Monochrome print, copy and fax
- Colour network scanning; including scan to email and scan to PC

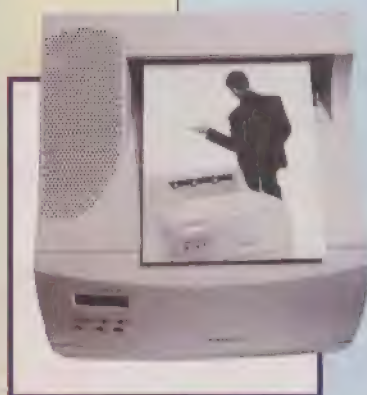
Features:

The Lexmark X520 solution can lower your cost of ownership by up to 50% when compared to separate devices. By consolidating supplies for print, copy and fax plus reducing your downtime, you benefit from lower costs along with simplified management of stocks.

plus

Purchase an X520 Laser Printer between 1st Dec and 21st Dec 2001 and get an Automatic Duplex Unit **FREE** (RRP value over \$600)

(D3932) GST INC **\$4,350**



Lexmark Optra M412 Laser Printer

Only Lexmark technology could deliver such a task-simplifying, productivity-enhancing laser printer for your small workgroup.

- Value-priced, feature-packed - and ready for your desktop with the option to network! Including PS3 and PCL6!
- Fast 17 page per minute printing exceeds your expectations without straining your budget
- Powerful 133MHz processor and less than 12 second time to first print gets your work done quickly
- Parallel and USB ports standard with a duty cycle of 40K pages

(A5689) GST INC **\$1,035**

EPSON

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The Power to Create

PRINTER

EPSON STYLUS C20UX

BONUS USB CABLE (in box)
while stocks last!



The Easy-To-Use Home Colour Printer that gives photo quality printing, and delivers best-in-class for overall cost effectiveness. **KEY FEATURES** • Up to 720 x 720 dpi photo quality printing • Fast, easy set-up and operation • USB equipped for simple plug and play printing • Up to 6.5 ppm black text printing

(C5572) GST Inc: **\$119**

PRINTER

EPSON STYLUS C40SX/C40UX



The Easy to use Quality Home Colour Printer with up to 1440 dpi. **KEY FEATURES** • Up to 1440 x 720 dpi photo Quality printing. • Fast, easy set-up and operation of both models. • Choice of USB or Parallel models, simple plug and play printing. • 8ppm black text speed and 3.9 ppm colour text speed.

C40SX (Parallel) (C5574) GST INC **\$169**

C40UX (USB) (C5573) GST INC **\$169**

WATER PRINTER



EPSON AL-C2000

EPSON technologies, including AcuLaser Multiple-screen Printing, Colour RIT and Colour Stabilizing. In addition, AcuLaser Colour Halftoning provides print resolution equivalent to 2,400 dpi (defined print resolution: 600dpi). Text is extremely sharp and photos have excellent contrast.

(A7365) GST Inc: **\$4,579**

PRINTER



EPSON STYLUS PHOTO810

• On-demand Inkjet (piezoelectric) • 48 x 6 nozzles • Black text (memo) A4 Approx. 12ppm (Economy) • full page colour A4 Approx. 1.4ppm (Normal)* • USB compatible • Colour: Cyan, Magenta, Yellow, Light Cyan, Light Magenta • DRIVERS Microsoft® Windows® 95/98/2000/Me/NT® 4.0.

(C9372) GST Inc: **\$375**

PRINTER



NEW

EPSON STYLUS C60

• 2880 x 720 dpi resolution • Fast 12ppm* for both Black and Colour Text Memo (*at economy mode) • Precise-Super fine detailed printing with up to 2880 dpi, MicroPiezo Print Head and 4pi Variable Sized Droplet Technology • Four-colour ink system.

(D0042) GST Inc: **\$280**

PRINTER



NEW

EPSON STYLUS C80

• Up to 20 ppm* for black text • Constant monitoring of ink consumption with the Intellidrive™ ink system in each of the four ink cartridges • Pigment inks for prints that are fade-, water- and smudge-resistant • Super fine printing with up to 2880 dpi.

(D1665) GST Inc: **\$615**

PRINTER



affordable
6-colour
printer

EPSON STYLUS PHOTO895

Outstanding Photographic 6-Colour Quality with Personal Digital Photo Lab Function. • Up to 2880 x 720 dpi photo • Quality printing resolution • PRINT Image Matching™ enabled • USB interface for plug-and-play • Over 20 years lightfastness***

(C9632) GST INC **\$695**

PRINTER



EPSON STYLUS COLOR1160

• Printing method - On-demand inkjet (piezoelectric) • Nozzle configuration - 144 nozzles (Black), 48 x 3 nozzles (Cyan, Magenta, Yellow) • Print direction - Bi-directional with logic seeking • Resolution - 1440 x 720 dpi • A3 Compatible.

(87723) GST INC **\$599**

SCANNER

EPSON PERFECTION 1250

This new EPSON scanner features resolution and scanning technologies which sets it apart from other scanners in its price class. • 1200 x 2400 dpi optical resolution • 48-bit colour depth (internal) • USB interface for plug-and-play

(C9439) GST Inc: **\$229**

SCANNER

EPSON PERFECTION 1650

Perfection 1650 series offers full auto scanning mode for documents and photos, and the Perfection 1650 Photo, in addition, feature auto batch scanning mode for film and slides, using its film adapter. Scanning • 1600 x 3200 dpi optical resolution • USB interface for plug-and-play

(C9387) GST Inc: **\$373**

SCANNER

EPSON EXPRESSION 1640XL

The Expression 1640XL A3+ scanner features EPSON's most advanced scanning technologies providing high speed, maximum detail and superior sharpness and clarity.

(B1330) GST Inc: **\$5,643**

LASER PRINTER

EPSON EPL 5800

The EPL-5800 Laser Printer is an excellent solution for small work groups, offering best-in-class features at a very attractive price: • True 1200 dpi • Fast 10ppm print mode • 16MB • Network ready • optional 10/100 BaseT Network Card • Optional Adobe Postscript 3 for high quality imaging and performance.

(A0812) GST Inc: **\$658**

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About...



Extend to a total of 3 Years Return to Base

Extend to a total of 5 Years Return to Base

Upgrade Return to Base of Warranty Extension to On-Site



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Delivery charges extra.

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49

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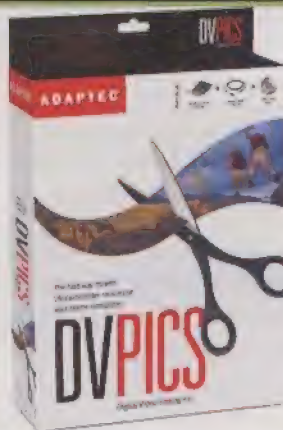
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Email: sales@ht.com.au

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Digital Video Editing & High-Speed USB2.0

Adaptec DVpics



Adaptec DVpics is a complete kit for making family movies in a snap! Just install the Adaptec FireWire/1394 adaptor card into a spare PCI slot in your PC and attach your DV camcorder. Then use the included MGI VideoWave editing software (Windows only) to capture video from the camcorder. The software lets you edit video to select parts, add titles, graphics, music & special effects.

Adaptec DVpics Video Editing Kit

(D3362) GST Inc: **\$189**

Adaptec DVpics Plus Kit (Firewire AFW-4300)

(D3365) GST Inc: **\$159**

Adaptec USB 2.0 Connect



Take advantage of USB 2.0 with Adaptec USB2CONNECT. The USB 2.0 standard provides speeds of up to 480 Mbps (40 times faster than USB 1.1) making it perfect for external devices, CD-RWs and more. All you have to do is install the USB2CONNECT card into a spare PCI slot in your PC and then install the Adaptec 2.0 drivers (Windows 98 SE, Windows Me and Windows 2000).

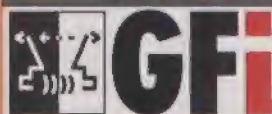
Adaptec USB2CONNECT 2.0 4 Port Card Kit

(D3333) GST Inc: **\$167**

Adaptec USB2CONNECT 2.0 6 Port Card Kit

(D3335) GST Inc: **\$197**

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VINTAGE CELLARS
vintagecellars.com.au



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Better Things to do than Guard your Network all Day?

Mail...entials

Email Content Checking & Anti-virus for Exchange



Mail essentials is the market leading email content security software. It acts as an Email Firewall and protects you from headline-hitting viruses such as Sircam, as well as email attacks targeted at your organization. In addition, Mail essentials adds important key features to your mail server, such as Anti-Spam, Email encryption, Email archiving, Disclaimers, Personalized auto responders, POP3 downloading and more.

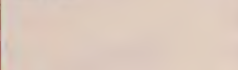
Native Exchange 2000 version is now available which also scans internal mail!

from: 10 users

(C4380) GST INC **\$677**

LANguard

Content Filtering and Anti-virus for ISA Server



LANguard for ISA Server helps you protect against the huge security risk posed by HTTP and FTP access from the workplace. Built on top of Microsoft ISA server, it scans all inbound material for viruses, Trojans or objectionable material. Using LANguard's powerful rules engine, you can configure rule sets that allow you to quarantine dangerous files for administrator approval.

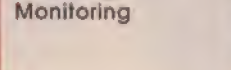
LANguard also enables you to set up rules that can prevent unproductive use of the Internet at the workplace.

from: 25 users

(C4366) GST INC **\$765**

LANguard

Intrusion Detection through Security Event Log Monitoring



LANguard Security Event Log Monitor (S.E.L.M.) is a revolutionary new intrusion detection product that alerts you to any unauthorized activity occurring on your network by monitoring the security event logs of all your Windows NT/2000 servers and workstations. A firewall will offer no protection against attacks originating from within the company.

LANguard SELM alerts you to possible intrusions/attacks in real time.

from: 5 User Workstations

(C9889) GST INC **\$265**

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at Kmart
Broadway-Sydney

Technology Centre Shoppers!
Not all products are in-store, but consulting & advice available on all items.

DEC 50

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FINANCE METHODS ARE SUBJECT TO APPROVAL

Video & Multimedia Tools

ADVC-100

DV CONVERTER

(D4514) GST Inc: **\$699**

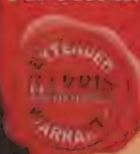
Convert your analogue tapes (S-VHS, Hi8 & 8mm) to DV (Digital) in one simple step!

The converted DV footage is then transferred to your PC/Mac via IEEE 1394 (i.Link/FireWire) and stored on your hard drive where they can be edited using your favourite Canopus or other video editing applications, or simply use the ADVC-100 to copy your analogue tapes into your DV camcorder to give you a digital copy, and to prevent deterioration! This device is ideal for all OHCI and DV-only capture cards for Macintosh or PC.



(D4516) GST Inc: **\$599**
(IF PURCHASED WITH A RAPTOR-RT)

Ask About...



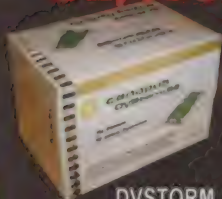
REAL TIME PRODUCTS

FOR REAL EDITORS...

Featuring multiple video tracks, filters, transitions, titles and analogue output. Create DVDs, SVCDs, VCDs and Web streaming.

DVSTORM SE
(C9352) GST Inc:

\$2,399^{*}**



DVRAPTOR-RT
(PREMIERE 6.0 REQUIRED)
(C5577) GST Inc:

\$1,199



DVSTORM SE
WITH STORM EDIT
(C9356) GST Inc:

\$2,699

DVRAPTOR-RT
WITH PREMIERE 6
(C6461) GST Inc:

\$1,499

EZDV

Using your DV Camcorder EZDV gives you Fast, Friendly and Easy Digital Video Editing for your PC. Quickly scan your tapes and edit your videos, insert cool 3D transitions, superimpose titles, then export the whole thing to VHS tape, VCD or DVD. Includes EZEdit, SoftMPEG, Xplode basics, and DVDit LE

EZDV

(97877) GST Inc:

\$499



EZDV WITH
PREMIERE 6
(C0023) GST Inc:

\$799

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(at top of page) for more products and latest info!

Hauppauge!

PERSONAL VIDEO RECORDER (USB & PVR)



HAUPPAUGE PVR USB

(D1776) GST Inc: **\$635**

HAUPPAUGE PVR PCI

(B2593) GST Inc: **\$669**



Bring live TV to your PC screen, watch it in a resizable or full screen window, or listen to FM radio with the stereo FM receiver. The PVR gives you total control by allowing you to record your favourite shows on your hard drive, pause when you want, create your own instant replay or even burn them to CD Rom!

HAUPPAUGE TV USB

(89066) GST Inc: **\$255**

HAUPPAUGE TV USB - FM

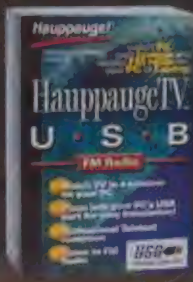
(98455) GST Inc: **\$285**

HAUPPAUGE TV GO

(89063) GST Inc: **\$139**

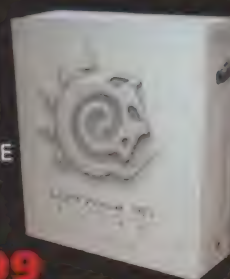
HAUPPAUGE TV GO - FM

(89064) GST Inc: **\$189**



LIGHTWAVE 3D V7

Model, Animate, Render - Proven for years in television, film, and games, LightWave 3D is also being used to create graphics for print, web, industrial design, architecture, medical imaging, and anywhere else a 3D package is needed. Off the shelf, LightWave 3D is the most complete and flexible software solution for 3D graphics and animation.



LIGHTWAVE
3D - V7

(D1758)

GST Inc:

\$4,999



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Using the toolbar-style interface, you can find 5,600+ of the most commonly used symbols with only 2 mouse clicks, and easily insert them into your drawings.

(A1319) GST INC

\$149

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Complies with Australian ISO Standards. 10,800+ symbols. Electrical IEC, Electrical JIC, Mechanical DIN/ISO Library, Hydraulics, Pneumatics, Materials Processing & Ventilation, Electronics, Organizational & Planning Libraries.

(A1320) GST INC

\$149

AutoCAD LT 2002



(C4281) GST INC **\$1,355**

(C4282) UPGRADE **\$369**

AutoCAD LT® 2002 is the only 2D CAD program providing 100 percent DWG compatibility with AutoCAD® 2002 based products. That means you can open, edit, and exchange drawing files (DWG) with complete confidence. A comprehensive Internet toolset streamlines collaboration between design team members, shortening cycle

times and reducing costs. Plus new enhancements like automated associative dimensioning help you create quality designs more efficiently. AutoCAD LT® 2002. Connected. Collaborative. And powerfully 2D.

AutoCAD LT® upgrades are also available, however AutoCAD LT® 98 will no longer be upgradable after the 15th of January 2002. Protect your investment by upgrading now.

AutoCAD 2002



(C7856) GST INC **\$7,199**

With AutoCAD® 2002, you can get your design information where it's needed—quickly, easily, and accurately. Its design collaboration tools help you maximize the value of your design data by sharing files, accessing design resources, and meeting in real time with the entire project team. With powerful features such as CAD standard management tools, associative dimensioning, new Object snaps, 3D Orbit and more,

AutoCAD® 2002 will help you create quality designs more efficiently giving you that strategic competitive advantage.

Protect your investment by upgrading your AutoCAD® Release 14 before 15th January 2002. Upgrades also available for AutoCAD® 2000 and AutoCAD® 2000i. Call for pricing.

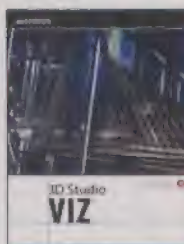
Autodesk 3D Studio Viz R3i

(C9773) GST INC

\$3,829

Bring your designs alive with Autodesk 3D Studio Viz R3i, a multimedia software tool that provides a visually rich, 3D, interactive user interface. 3D Studio VIZ R3i is easy to use & is interoperable with AutoCAD® applications.

Upgrades also available. Price on application.



Autodesk CAD Overlay 2002

(D1729) GST INC

\$2,445

Whatever raster images your projects require - scanned paper drawings, maps, photos - Autodesk® CAD Overlay® 2002 is the solution for precise and seamless integration of your image data.

Upgrades also available. Price on application.



Volo View 2

(D1736) GST INC

\$385

Volo™ View 2 software is a cost-effective, easy-to-use digital design viewing solution that lets everyone on your team electronically review, mark up, measure, and plot AutoCAD® and Autodesk Inventor™ based drawings.

Upgrades also available. Price on application.



Autodesk OnSite View 2

(D1738) GST INC

\$389

Use Autodesk OnSite View 2 to review, mark up, and measure AutoCAD® DWG and DXF™ drawings right at the point of work on your Microsoft® Windows® CE based mobile computing devices.

Upgrades also available. Price on application.

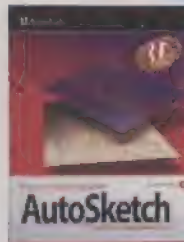


AutoSketch 7

(C4386) GST INC

\$185

From concept sketches, information graphics, and floor layouts to presentations, electrical drawings, and home project plans, you can draw it - quickly and accurately - with AutoSketch® Release 7 software.



QuickCAD Millennium 7

(80899) GST INC

\$89

Begin designing on a computer right away with QuickCAD™ Millennium Edition 7. Plenty of productive features let you make technical designs and diagrams, and you can start drawing the very first time you use it.



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Adobe The world standard image editing solution

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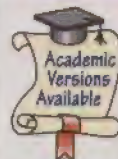
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(C9237) GST Inc: **\$864**
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Painter 7



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Part of the **procreate™** line of software, KnockOut 2 lets you preserve fine image details that were once impossible to mask precisely. It's an ideal plug-in for Adobe® Photoshop®.

(D3901) GST Inc: **\$736**

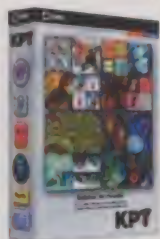


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FILEMAKER SERVER 5.5

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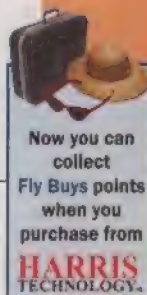
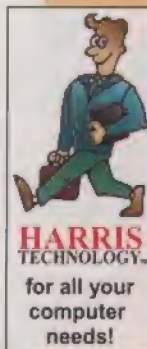
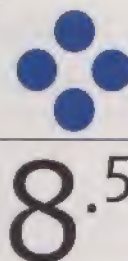

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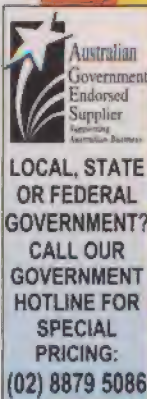
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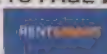
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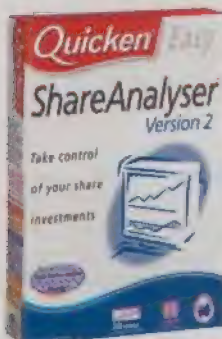
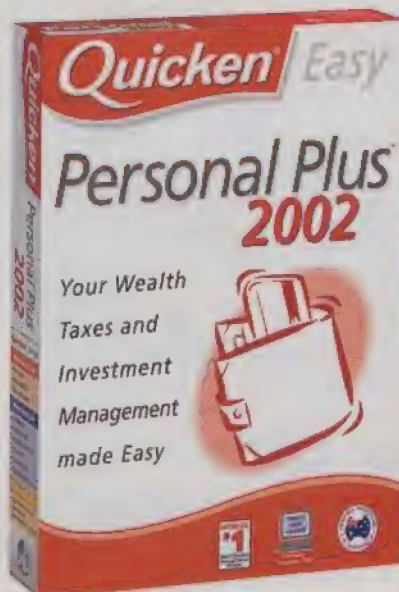
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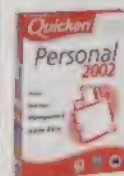
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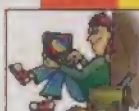
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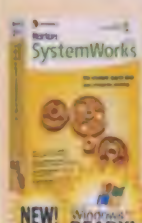


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Norton Internet Security™ 2002 is your essential protection from viruses, hackers and privacy threats. Contains a full version of Norton AntiVirus™ 2002 & Norton™ Personal Firewall 2002

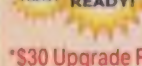


(D0219) **\$115**

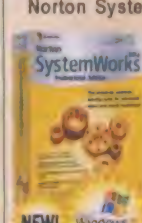


Norton SystemWorks 2002

This award-winning suite protects your PC against virus threats, optimizes performance, cleans out Internet clutter, and provides quick and easy system recovery. Includes:
Norton AntiVirus™ 2002,
Norton Utilities™ 2002
Norton CleanSweep™ 2002

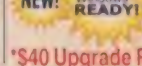


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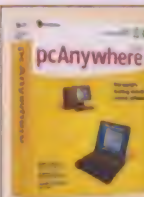
Norton SystemWorks 2002 Professional Edition

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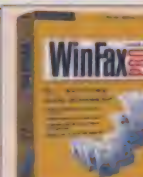


Norton Internet
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(D4517)

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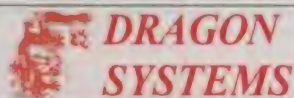


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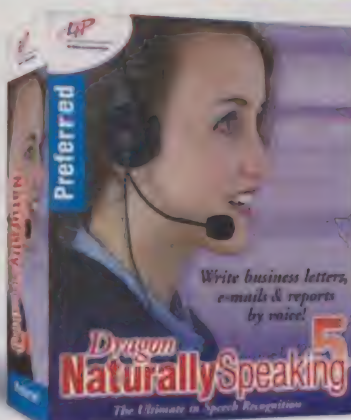
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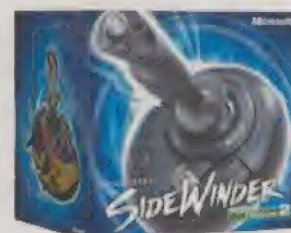


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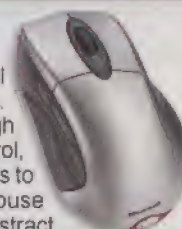
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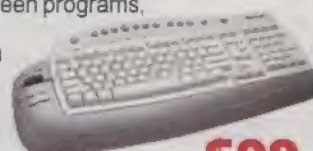


(D0990) GST Inc: **\$127**



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Discover the Microsoft® Office Keyboard, our most efficient, most productive, most personal keyboard ever. Now you can scroll, move between programs, cut, copy, paste, go back and forward at the touch of a button. The unique, left-side Single Touch Pad offers you two-handed control and flexibility for a more efficient way to work. Built for comfort and to make optimum use of Microsoft Office products and popular browsers, this is the keyboard designed for the way you really work.



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19 Hot Keys allow you to access the Internet, e-mail and your favorite programs directly from your keyboard. The split, gently sloped shape of the Natural Keyboard Pro encourages a natural hand, wrist and forearm position. Two desktop USB ports - Plug USB devices directly into your keyboard.

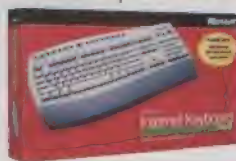
(87385) GST Inc: **\$96**



IntelliMouse Optical

The optical sensor provides smooth and precise movement. Optical also is equipped with a wheel for efficient scrolling and has additional buttons to enhance forward and back navigation on the Internet.

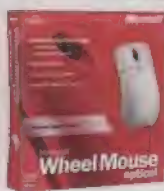
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Internet Keyboard Pro

The Internet Keyboard Pro brings 19 customizable Hot Keys and 2 USB ports to a comfortable standard keyboard design that also includes a detachable palm rest. Browse the web, check e-mail, or play a CD directly from your keyboard. The USB ports enable you to plug your latest USB devices.

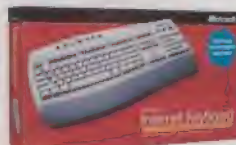
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WheelMouse Optical

Wheel Mouse Optical brings the precision and accuracy of IntelliEye optics to an affordable mouse. Accelerated scrolling reacts to how quickly you roll the wheel, saving you time and effort plus the three buttons (incl. the wheel button) can be reprogrammed easily.

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




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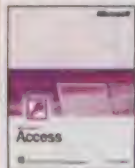
The Microsoft Office XP Family

NOW AVAILABLE - THE SMARTER WAY TO WORK!

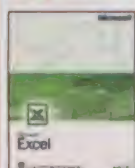
Microsoft® Office XP is the most significant version of Office ever released and redefines the relationship between people and software by delivering an exciting new set of experiences that provide a smarter way of working. Office XP delivers a **personal experience**, simplifying the way individuals work; a **collaborative experience**, enabling people to easily collaborate on documents and to work more effectively with others and an **organisational experience** by allowing organisations to increase their overall productivity.

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-  New **Task Pane** gives you instant access to the features you need most.
-  New **Outlook** brings all your personal and professional e-mail together in one place.
-  New **Document Recovery** is designed to reliably protect your works-in-progress.
-  **Send for Review** gathers everyone's revisions all at once, on a single document.
-  **PowerPoint** includes innovative new features that bring YOUR big ideas to life!
-  Office XP meshes information and images more creatively, for more powerful presentations.

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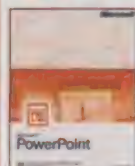
ACCESS
(C2080)
GST Inc:
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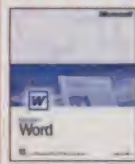
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




















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
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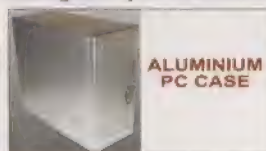
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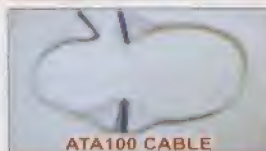
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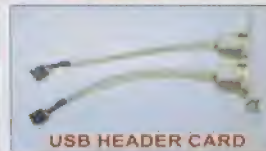
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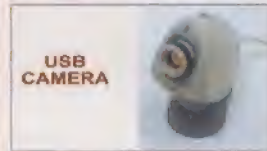
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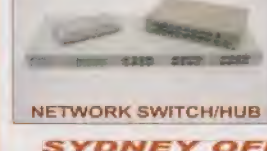
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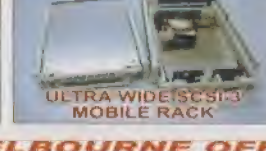
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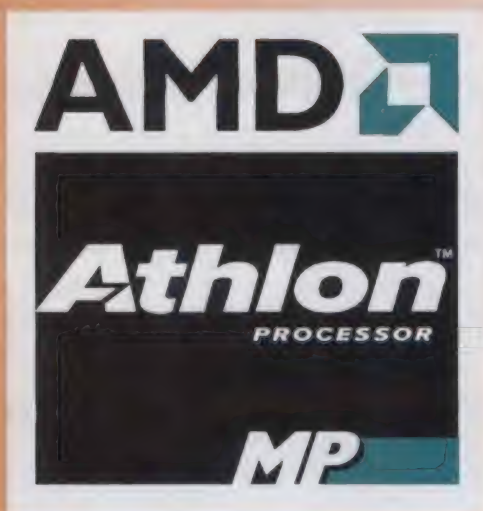


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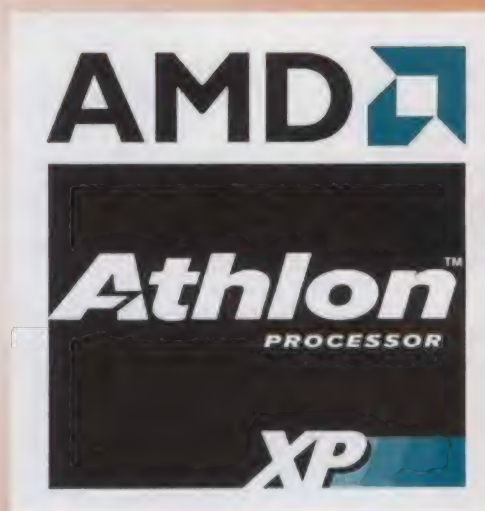
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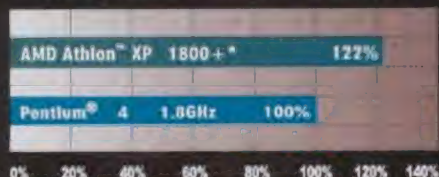
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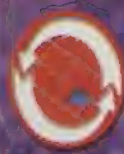
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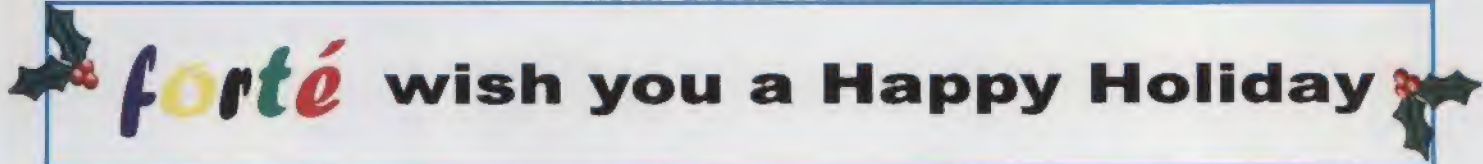
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Pioneer 16x DVD 40xR IDE Bare Drive (OEM) (#116)	\$142
SAMSUNG 12X DVD IDE Bare Drive (oem)	\$117
SONY 12X DVD IDE Bare Drive (oem)	\$120
Pioneer 16x DVD 40xR SCSI Bare Drive (Retail)	\$335
Creative Encore K1 12x DVD + MPEG Card (Retail)	\$304
Creative DXR3 MPEG II DVD Card (OEM)	\$257
Panasonic 16x DVD IDE Bare Drive (OEM)	\$191

CD REWRITERS

Plextor 16x10x40 IDE + Soft + Media	\$676
Plextor 12x10x32 SCSI + Soft + Media	\$637
Plextor 12x10x32 SCSI External	\$799
HP 9140x (8x4x32) IDE	\$242
HP 9710i	\$380
HP 9500i (12x6x32) IDE	\$288
HP 9600i (12x6x32) SCSI	\$709
HP 8230x (4x4x8) Ext USB	\$426
HP 9600i (12x6x32) Ext SCSI	\$892
LG 40 x 16 x 10 CD RW IDE OEM	\$188
Ricoh 7163A (16x10x32) IDE K1	\$227
Ricoh 7200A (20x10x40) IDE K1	\$288
Creative (16x10x40)	\$230
Sony 160S (12x6x32) SCSI Bare Drive (OEM)	\$434
Sony 180E (12x6x32) IDE Bare Drive (OEM)	\$242
Imega (40x16x10) IDE OEM Internal With Software	\$231
Imega Zip (12x10x32) Int IDE	\$561
Imega Zip (4x4x8) Ext USB	\$466

Canon S450	\$290
Canon S800	\$564
Canon BJC-4500 (A3)	\$596
Canon BJC-4550 (A3) (opt. Scanner)	\$400
Canon LBP-810 12ppm Laser	\$500
Canon LBP810W 8ppm (USB & PARR)	\$506
Canon B-155 Bubble Jet Fax	\$400
Canon MPC-75 Multifunction Photo BJ 4 in 1	\$524
Canon MPL-60 Multifunction Laser 4 in 1	\$1,201
Epson Stylus Color C20UX (USB) (720x720)	\$113
Epson Stylus Color C40UX (USB) (1440x720)	\$164
Epson Stylus Color C40SX (PRT) (1440x720)	\$164
Epson Stylus Color C60U	\$265
Epson Stylus Color C70U	\$415
Epson Stylus Color C80	\$582
Epson Stylus Color 980 (2880x720) (+USB)	\$682
Epson Stylus Color 1160 (A3+)	\$567
Epson Stylus Photo 810 (1440x720) (USB)	\$351
Epson Stylus Photo 890 (1440x720) (USB)	\$594
Epson Stylus Photo 895 (1440x720) (USB)	\$793
Epson Stylus Photo 1290 (A3+)	\$971
Epson Stylus Photo 2000P (A3+)	\$1,723
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Epson EPL-5800	\$641
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HP DeskJet 840C	\$227
HP 8230x (4x4x8) Ext USB	\$272
HP DeskJet 970Cxi	\$548
HP DeskJet 990Cxi	\$729
HP DeskJet 1125C (A3)	\$583
HP DeskJet 1220C (A3)	\$860
HP PSC 750 All in 1	\$733
HP OfficeJet T65 All in 1	\$460
HP OfficeJet T65 All in 1	\$899
HP OfficeJet G85 All in 1	\$1,196
HP OfficeJet G85 All in 1	\$1,550
HP LaserJet 9L Pro	\$615



Asus CUV-4XDL5	\$754
Asus A7V-E/A (VIA, Soc-A, U-100, Audio)	\$319
Asus A7V133 (VIA, Soc-A, U-100) (RAID)	\$318
Asus A7V133-C (VIA, Soc-A, U100, No RAID)	\$260
Asus A7V266 (Soc-A, U-100, AGP Pro 4x)	\$381
Asus A7A266 (Soc-A, U-100, AGP Pro 4x)	\$346
Asus A7M266 (VIA, Soc-A, U-100)	\$401
ECS ELITE P418AS (Intel 486, 50, SDRAM, Audio)	\$386
Gigabyte GA-6VX7-4X-P (VIA, S370, AGP 4x, U100)	\$158
Gigabyte GA-720X (VIA Soc-A ATA100 Audio)	\$247
Gigabyte 8TX (PGA 423 socket, SDRAM, ATX)	\$396
Gigabyte 8M4 (Soc-A, 486, SDRAM, Audio, LAN)	\$200

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128MB PC133 SDRAM ECC 168pin	\$124
256MB PC133 SDRAM ECC 168pin	\$220
512MB PC133 SDRAM ECC 168pin	\$523
64MB Rambus RDRAM 800MHz ECC	\$56
128MB Rambus RDRAM 800MHz ECC	\$144
256MB Rambus RDRAM 800MHz ECC	\$289
128MB DDR DIMM PC2100	\$89
256MB DDR DIMM PC2100	\$164

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40Gb Seagate u-100 5400	\$244
40Gb 753XP IBM Deskstar U-100 2M 7200	\$299
60Gb 753XP IBM Deskstar U-100 2M 7200	\$430
753XP IBM Deskstar U-100 2M 7200	\$648
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30Gb Quantum FB AS U-100 2M 7200	\$253
40Gb Quantum FB AS U-100 2M 7200	\$277
60Gb Quantum FB AS U-100 2M 7200	\$403
20Gb WD Caviar/Master U-100 5400	\$201
40Gb WD Caviar U-100 5400	\$269
20Gb WD Caviar U-100 7200	\$238
40Gb WD Caviar U-100 7200	\$300
80Gb WD Caviar U-100 7200	\$561

HARD DISKS - NOTEBOOK

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15g Hitachi	\$261
20g Hitachi	\$284
30g Hitachi	\$469

HARD DISKS - SCSI

9.1Gb Fujitsu U-160 7200rpm MC	\$382
18.2Gb Fujitsu U-160 10000rpm	\$508
36.2Gb Fujitsu U-160 10000rpm	\$978
73.2Gb Fujitsu U-160 10000rpm	\$1,912
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18Gb Quantum Atlas V U-160 LVD68	\$513
90Gb Quantum Atlas 10K II U-160 LVD68	\$392
18Gb Quantum Atlas 10K II U-160 LVD68	\$632
36Gb Quantum Atlas 10K II U-160 LVD68	\$934
9.2Gb Seagate Barracuda LVD68	\$423
18.4Gb Seagate Barracuda U-160 LVD68	\$514
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9.2Gb Seagate Cheetah LVD68 10,000rpm	\$469
18.4Gb Seagate Cheetah LVD68 10,000rpm	\$509
36.7Gb Seagate Cheetah LVD68 10,000rpm	\$972
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18Gb IBM Ultrastar 36LZX U-160 10k LVD68	\$475

Hitachi CML152XW 15" TFT Monitor	\$806
"Hitachi CML170SXW 17" TFT Monitor	\$1,802
"13.5" SWS70LE LCD Monitor	\$1,472
"17" W880LL LCD Monitor	\$5,482
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Mitsubishi TFT 17" RD1780S 1280x1024	\$5,291
NEC 15" LCD 1525V Monitor 1024 x 768	\$2,053
NEC 15" LCD 1525M Monitor 1024 x 768	\$2,282
NEC 18" LCD 1810 Monitor 1280 x 1024	\$6,392
NEC 20" LCD 2010X Monitor 1280 x 1024	\$9,417
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Panasonic 19" LC90S LCD 0.25+USB+Speakers	\$7,248

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Deluxe Mid Tower ATX 300W (For Pentium 4)	\$78
Asus P4 Full Tower ATX HQ08 300w	\$256
Asus P4 Mid Tower ATX KF45	\$89
Asus Desktop ATX HX95	\$126
Asus Full Tower ATX HX08	\$206
Maxcase Mid Tower ATX KA-80 250W	\$127
Maxcase Mid Tower ATX KA-80 300W	\$139
Maxcase Mid Tower ATX KA-80WDP 250W	\$131
Maxcase Mid Tower ATX KA-80WDP 300W	\$142
Maxcase Desktop ATX (250W)	\$127
Maxcase Full Tower ATX KA-C80 FAN DUST 300W	\$256
Maxcase Server Tower ATX KAC66 (2X300W)	\$1,221
Maxcase Server Tower ATX KAC66 (1X300W)	\$523
Maxcase Server Tower ATX KAC68 (1X400W)	\$909
Maxcase KIP20 40 Rackmount ATX Case 300W	\$612
Maxcase KIP32 40 Rackmount ATX Case 300W	\$496

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Acer AccuFeel Keyboard PS/2	\$13
Honeywell Eurobond M-Media Din-54PS/2	\$65
Logitech Internet Keyboard PS/2 (oem)	\$53
Logitech Cordless Touch	\$128
Logitech Touch Keyboard w/ 2 USB Ports	\$114
Logitech Class Keyboard + Mouse (oem)	\$150
Logitech Class Freedom Pro (Kb + Mouse)	\$220
Microsoft Internet Keyboard PS/2 (oem)	\$49
Microsoft Ergonomic Elite PS/2	\$163
Microsoft Natural Keyboard Pro PS/2&USB	\$124

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A4+ 400dpi 2-Button Serial	\$7
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Dual Scroll wheel mouse PS/2	\$14
Swann Mini Mouse (Blueberry) USB	\$14
Logitech Wheel Mouse PS/2 (oem)	\$42
Logitech Wheel Mouse USB (oem)	\$42

Yamaha (16x10x24) Ext Firewire + Soft + Media	\$772
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Sound Blaster Live 128 (oem)	\$45
Sound Blaster PCI-128 2-Channel (oem)	\$55
Sound Blaster LIVE (oem)	\$99
"Sound Blaster LIVE DE 5.1	\$125
Sound Blaster LIVE Platinum 5.1	\$420
Creative Audigy (Retail)	\$201
Creative Audigy Platinum	\$475
Creative Audigy EAX	\$554
GUILLEMOT MAXI SOUND MUSE (Retail)	\$75
Guillemot Maxi Studio ISIS XL	\$700

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180W PMPO Stereo Power	\$15
"TS 297 3-P Subwoofer Premium Speakers	\$45
PLC WS-80 20W Sub woofer	\$39
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"Altec Lansing ACSA5 1 Power Cube - 3p	\$163
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Altec Lansing ADA-890 Dolby AC3 - 5p	\$619
Cambridge PCWorks 3-p	\$78
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Cambridge FPS1500 4-p Surround Digital	\$172
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CC-3BK	BJI-643BK	BJC-800/820 Black	\$12.00
CC-4BK	BCI-21	BJC-2000/4000/5000 Series Black	\$7.00
CC-5CL	BCI-21C	BJC-2000/4000/5000 Series 3-Colour	\$12.00
CC-6BKHC	BJI-201BK HC	BJC-600/610/620 Hi-Cap Black (14ML)	\$9.00
CC-7BK	BCI-10	BJ-30 Black	\$9.00
CC-8BK	BCI-11	BJC-70 Black	\$9.00
CC-9CL	BCI-11C	BJC-70 3-Colour	\$17.00
CC-11CL	BCI-61	BJC-7000 Series 3-Colour	\$32.00
CC-12PCL	BCI-62 PHOTO	BJC-7000 Series Photo 6-Colour	\$38.00
CC-13B	BCI-3	BJC-6000 Black	\$25.00
CC-14C	BCI-3C	BJC-6000 Cyan	\$16.00
CC-15M	BCI-3M	BJC-6000 Magenta	\$16.00
CC-16Y	BCI-3Y	BJC-6000 Yellow	\$16.00
CC-17PBK	BCI-3PBK	BJC-6000 Photo Black	\$18.00
CC-18PC	BCI-3PC	BJC-6000 Photo Cyan	\$18.00
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CE-53CL	SO20028	STYLUS Colour/Colour Pro 3-Colour	\$30.00
CE-54BK	SO20047	STYLUS 200/820/Colour II /IIs Black	\$13.00
CE-55CL	SO20049	STYLUS 200/820/Colour II /IIs 3-Colour	\$21.00
CE-56PBK	SO20093	STYLUS Colour 400/500/600/Photo Black	\$17.00
CE-57CL	SO20097	STYLUS Colour 200/500 3-Colour	\$23.00
CE-58BK	SO20108	STYLUS Colour 800/850/1520 Black	\$17.00
CE-59CL	SO20089	STYLUS Colour 400/600/800/1520 3-Colour	\$23.00
CE-60PCL	SO20110	STYLUS Colour 700/Photo/Photo 700 5-Colour	\$26.00
CE-61BKCL	SO20138	STYLUS Colour 300 4-Colour	\$31.00
CE-65BK	SO20187	STYLUS Colour 440/640/660 Black	\$16.00
CE-66BK	SO20189	STYLUS Colour 740/760 Black	\$16.00
CE-67CL	SO20191	STYLUS Colour 440/640/660/740/760 3-Colour	\$26.00
CE-68PCL	SO20193	STYLUS Photo 750 5-Colour	\$33.00
CE-69CL	T003011	STYLUS Colour 900 Black	\$19.00
CE-70CL	T005011	STYLUS Colour 900 Colour	\$24.00
CE-71PCL	T001011	STYLUS Photo 1200 5-Colour	\$29.00
CE-27BK	T007	STYLUS Colour 870/1270 Black	\$24.00
CE-73CL	T008	STYLUS Colour 870 Colour	\$29.00
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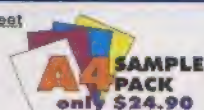


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A3WF	A3 White Film 100mu	50	\$ 90.00	1.80
A4CF	A4 Clear Film 100mu	50	\$ 39.00	0.78
A3CF	A3 Clear Film 100mu	50	\$ 71.00	1.42
A4FGP	A4 Full Gloss Photo Paper	50	\$ 44.00	0.88
A3FGP	A3 Full Gloss Photo Paper	50	\$ 79.00	1.58
A4PH	A4 Economy Photo Paper	50	\$ 23.00	0.46
AC2	Artists Canvas	25	\$ 60.00	2.40
GC4F	Greeting Card (4 Fold)	100	\$ 28.00	0.28
GCBF	Greeting Card (BI-Fold)	100	\$ 48.00	0.48
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GCS	Glossy Card Stock	50	\$ 24.00	0.48
TTP	T-Shirt Transfer Paper	15	\$ 15.00	1.00
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CANON BJ-300/330	7	4-BKL
CANON BJC-600/610/620	16	5-BKL
CANON BJC-2000/4000/4100/4200/4300/4550/5000/5500 BCI-21	45	19-BKL
CANON BJC-2000/4000/4100/4200/4300/4550/5000/5500 BC-20	9	18-BKL
CANON BJC-3000/6000/8000 Series	12	46-BKL
HP Desk Jet 400/500 Series	6	8A-BKL
HP Desk Jet 600/660/690 Series	6	8B-BKL
HP Desk Jet 700/800/900/1000 Series	8	29-BKL
HP Desk Jet 300 Series & Olivetti JP's!	8	7-BKL
EPSON Stylus 400/800/1000 Series	8	1-BKL
EPSON Stylus Colour /PRO/XL	12	2-BKL
EPSON Stylus 820/colour II/Is	12	23-BKL
EPSON Stylus Colour 200/300/400/500/600/800/850/1520	12	33A-BKL
EPSON Stylus Colour 440/460/480/640/660/700/740/760/900	12	33B-BKL
IBM/LEXMARK 4076/1000/1020/2000/2030/2050 Series	12	35A-BKL
IBM/LEXMARK 5000/5700/7000 & Z Series	12	35B-BKL
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CANON BJC-600/610/620	3x8	10-CLR
CANON BJC-2000/4000/4100/4200/4300/4550/5000/5500 BCI-21	3x30	17-CLR
CANON BJC-3000/6000/8000 Series	3x8	47-CLR
HP Colour Desk Jet 300/400/500 Series & Olivetti!	3x12	14A-CLR
HP Colour Desk Jet 600C/660C/690C Series	3x12	14B-CLR
HP Desk Jet 850C/855C/870C/1000C Series	3x3	30A-CLR
HP Desk Jet 710/720/890/900 Series	3x3	30B-CLR
EPSON Stylus Colour /PRO/XL	3x4	16-CLR
EPSON Stylus 820/colour II/Is	3x12	24-CLR
EPSON Stylus Colour 200/300/400/500/600/800/850/1520	3x12	34A-CLR
EPSON Stylus Colour 440/460/480/640/660/700/740/760/900	3x12	34B-CLR
IBM/LEXMARK 4076/1000/1020/2000/2030/2050 Series	3x6	36A-CLR
IBM/LEXMARK 5000/5700/7000 & Z Series	3x6	36B-CLR
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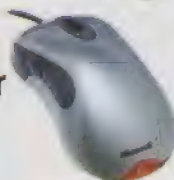
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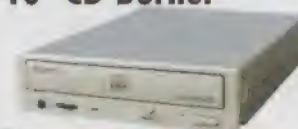


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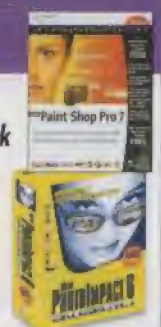
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Athlon XP 1800+ \$3259
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CWS BusinessPro 8000

Genuine AMD Processor, Gigabyte 7ZXX Motherboard, 256Mb PC-133 SDRAM, 40Gb Ultra -100 HDD, 64M GeForce II MX, IOMEGA 40x16x10 CD-RW, Integrated 3D Sound, 1.44 FDD 180W PMPO Stereo Speakers, 400W, Two Fans Tower Case CWS Internet keyboard, PSII Mouse 10/100 Network card, 56K Modem Win XP Pro, Office XP Pro

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CWS QuamPro 5000

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Intel P4-1.9G \$2772
Intel P4-2G \$3256
Intel P4 1.5G \$2241

CWS HomePro 3000

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Genuine Intel Processors, Gigabyte 6VM7-4E Motherboard, 256Mb SDRAM PC133, 30Gb 7200 rpm Ultra -100 HDD, Stylish 250W ATX tower Case, 32M GeForce II MX AGP, 1.44Mb, 3.5" Floppy Drive, Microsoft internet keyboard, Microsoft Intellimouse, IOMEGA 40x16x10 CD-RW Creative Sound Card, 56k MD Aitec Lansing ACS33 -3p speaker; WIN XP Pro CD, Office XP PRO

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PIII-866 \$2078
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Intel P4-1.7G \$1917
Intel P4-1.8G \$2084
Intel P4-1.9G \$2302
Intel P4-2G \$2786
Intel P4 1.5G \$1771

Economic Series I

Genuine Intel Processors, Gigabyte 6VM7-4E Motherboard, 128Mb SDRAM PC133, 20Gb Ultra -100 HDD, Stylish 250W ATX tower Case, 16M TNT 2 AGP, 1.44Mb, 3.5" Floppy Drive, CWS Internet keyboard, Microsoft Intellimouse, Ricoh 32x8x8 CD-RW Drive Creative Sound Card, 480W PMPO Stereo Speakers, Motorola 56k V.90 Fax/Voice, Win XP CD & AntiVirus,

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Cel-950 \$1081
Cel-1G \$1095
PIII-866 \$1251
PIII-933 \$1328
Celeron 850MHz \$1040

Economic Series II

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Cel-950 \$915
Cel-1G \$928
PIII-866 \$1105
PIII-1000 \$1162
Celeron 850MHz \$873

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Duron-950 \$909
Duron-1G \$929
Athlon-1.1G \$1004
Athlon-1.2G \$1020
Athlon-1.33G \$1045
Duron 850MHz \$873

CWS Notebook PowerA	Intel P-III 1.4, 14.1" TFT, 128MB, 20GB, 8X DVD, Win XP	\$2848
CWS Notebook PowerA	Intel P-III 1G, 14.1" TFT, 128MB, 20GB, 24X CD-ROM, Win XP	\$2700
CWS Notebook PowerA	Intel P-III 933, 14.1" TFT, 128MB, 20GB, 8X DVD, Win XP, Office XP	\$3251
CWS Notebook PowerA	Intel Celeron 850, 14.1" TFT, 128MB, 10GB, 8X DVD, Win XP, Office XP	\$2944
CWS Notebook PowerA	Intel Celeron 850, 14.1" TFT, 64MB, 10GB, 24X CD-ROM, Win XP	\$2,244
CWS Notebook PowerB	Intel P-III 1G, 13.3" TFT, 128MB, 20GB, 8X DVD-ROM, Win XP	\$2,734
CWS Notebook PowerB	Intel P-III 1G, 13.3" TFT, 128MB, 20GB, 24X CD-ROM, Win XP	\$2,541
CWS Notebook PowerB	Intel P-III 933, 13.3" TFT, 64MB, 10GB, 24X CD, Win XP, Office XP	\$2,978
CWS Notebook PowerB	Intel Celeron 850, 13.3" TFT, 64MB, 10GB, 24X CD-ROM, Win XP	\$2,164

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Canon A4, BJC 85	\$357
Canon A4 BJC 55	\$536
Canon A4 BJC 1000sp	\$102
Canon A4 BJC 2100sp	\$136
Canon A4 BJC S300	\$254
Canon A4 BJC S400	\$210
Canon A3 BJC 4650	\$382
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Canon A4 BJC S800	\$576
Canon A4 BJC S450	\$277
Canon A3 BJC S5500	\$1184
Canon Laser LBP 810	\$496
Canon Laser LBP 1000	\$1,135
Canon Laser LBP 1760	\$1,604

Printer Epson

Epson Stylus Colour C20UX	\$119
Epson Stylus Colour C40UX	\$158
Epson Stylus Colour C40xX	\$158
Epson Stylus Colour C60	\$258
Epson Stylus Colour C70	\$388
Epson Stylus Colour C80	\$544
Epson Stylus Colour 1160	\$633
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Satellite 3000CDT	PIII 850, 192M, 15G, 14.1" TFT, 8XDVD, WIN ME, LAN & 56K	\$3,048
Satellite Pro 4600	Cel 750, 192M, 15G, 14.1" TFT, 8XDVD, WIN98, LAN & 56K	\$2,742
Satellite Pro 4600	PIII 750, 256M, 15G, 14.1" TFT, 8XDVD, WIN98, LAN & 56K	\$3,302
Satellite Pro 4600	PIII 850, 256M, 20G, 14.1" TFT, 8XDVD, WIN98, LAN & 56K	\$3,455
Satellite Pro 4600	PIII 900, 256M, 30G, 15" TFT, 8XDVD, WIN98, LAN & 56K	\$4,422
Portege 3490CT	PIII 700, 128M, 20G, 11.3" TFT, Win 98-Ultra Portable	\$4,066
Portege 4000CT	PIII 750, 128M, 20G, 12.1" TFT, WIN98, Wireless LAN	\$4,706
Tecra 9000	PIII 866, 256M, 20G, 14.1" TFT, WIN98, DVD, 56K, win98	\$5,290
Tecra 8200	PIII G, 256M, 20G, 14.1" TFT, WIN98, 8XDVD, CD-RW 56K, Lan	\$7,302
Tecra 9000	PIII G, 512M, 30G, 14.1" TFT, DVD/CDRW, 56K, Wire/L, Lan	\$7,813

IBM ThinkPad Notebook

L-series	Cel 700, 64M, 10G, 13.3" TFT, 24XCDROM, WINME, 56K	\$2,154
A22e	Cel 800, 64M, 15G, 13.3" TFT, 24XCDROM, WIN98, LAN & 56K	\$2,725
A22e	Cel 800, 64M, 15G, 14.1" TFT, 24XCDROM, WIN98, LAN & 56K	\$2,921
A22m	PIII G, 256M, 30G, 14.1" TFT, 8XDVD, WIN98, LAN & 56K	\$4,191
T22	PIII 900, 256M, 20G, 14.1" TFT, 8XDVD, WIN98, LAN & 56K	\$5,774
X21	PIII 700, 128M, 20G, 12.1" TFT, WIN2K, LAN & 56K	\$4,191

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Aopen 250W ATX KF-45 Midi case	\$83
AAA 250WATX Medium tower case	\$40
AAA 300W ATX Medium tower case	\$75
AAA 250W ATX Desktop case	\$47
ATX Fulltower case(6x5.25"x3x3.5")	\$100
ATX P4 CASE 300W,	\$60
ATX P4 CASE 300W, Luxury	\$100
P4 Server CASE 400W(6x5.25" & 1x3.5")	\$125

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Blank CD-RW	\$3
Sony Blank CD-R 80 Mn (10 in a box)	\$12
Blank CD-RW (10 in a box)	\$27

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Ricoh 32x8x8 CD-RW, w/software	\$160
Sony 40x16x10 CD-RW, w/ software	\$220
Phillips 32x8x4 CD-RW, w/ software	\$156
Acer 40x16x10 CD-RW, W/ software	\$205
Imagema 40x16x10 CD-RW, W/ software	\$195

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Creative 52x speed CD-ROM drive,	\$71

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Pioneer 16x DVD ROM(Slot)	\$145

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1.44Mb 3.5" Floppy drive	\$26
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Seagate 30Gb Barracuda ATA III	\$215
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Seagate 60Gb Barracuda ATA IV	\$359
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Canon BJC-21(C) 4000&2100sp Series	\$14
S2047(B) Epson Stylus Color 200/110s/820	\$5
S2049(C) Epson Stylus Color 110/110s/820	\$5

S2093(B) Epson Stylus 400/500/600/700/Photo

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\$5	S20108(B) Epson Stylus Color 800/1520
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\$18	S20110(C) Epson Stylus Photo 700/PhotoEX
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\$40	Microsoft Internet K/B PS/2
\$13	AAA Windows 98 K/B, PS/2
\$19	AAA Internet K/B, PS/2
\$13	AAA Windows 98 K/B, AT
\$130	Logitech cordless K/B&Mouse
\$39	Logitech Internet K/B
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\$29	128MB PC133 SDRAM 168pin
\$51	256MB PC133 SDRAM 168pin
\$121	512MB PC133 SDRAM 168pin
\$32	128MB PC133 SDRAM, Kingmax
\$59	256MB PC133 SDRAM, Kingmax
\$42	128MB DDR DIMM 2100
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\$49	64MB Rambus RDRAM 800Mhz
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\$81	SWANN 56K USB
\$106	SWANN 56K TURBO EXTERNA
\$145	SWANN 56K Smart II EXTERNA
\$215	NETCOMM 56k Internal
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\$300	Intel D850GB P 4 M/b(423)
\$317	MSI Intel D845 Pro P4 M/b(478)
\$290	Gigabyte 8IDX3, 423, P4 M/b
\$151	Gigabyte 6VXC7-4XP,
\$160	Gigabyte 6VX7-4E, w/ sound
\$146	Gigabyte 7IXE4, For ATHLON
\$188	Gigabyte 7ZX-H, For ATHLON
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Armada 110	Cel 700, 192M RAM, 10G, 24X CDROM, 14.1" TFT, 56K, LAN, WIN ME	\$2,350
Armada 110	P3 800, 128M RAM, 10G, 8X DVD, 14.1" TFT, 56K, WIN ME	\$2,099
Armada EVO	P3 800, 192M RAM, 15G, SWAPPABLE DVD, 14.1" TFT, 56K, WIN 98/ME	\$3,500
Armada E500	P3 850, 256M RAM, 20G, 6X DVD, 15.1" TFT, 56K, 10/100, WIN 98	\$4,650
Presario 1200	P3 800, 64M RAM, 15G, 24X CD, 13.3" TFT, 56K, WIN ME	\$2,413
Presario 1400	P3 800, 192M RAM, 10G, 6X DVD, 13.3" TFT, 56K, WIN ME	\$3,242
Presario 1700	P3 650, 192M RAM, 10G, 24 CD, 13.3" TFT, 56K, LAN, TV OUT, WIN 98	\$2,758
Presario 1700	P3 800, 256M RAM, 15G, 6X DVD, 13.3" TFT, 56K, LAN, TV OUT, WIN ME	\$3,720
Presario 1700	P3 850, 256M RAM, 20G, 6X DVD, 14.1" TFT, 56K, LAN, WIN ME	\$4,414

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\$189	Intel 1000 Celeron, S370
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\$450	Intel Pentium 4-1.7G,
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\$900	Intel Pentium 4-1.9G,
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\$137	AMD Duron Socket A 900
\$153	AMD Duron Socket A 950
\$152	AMD Duron Socket A 1000
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\$106	AAA 800W Sub-woofer speaker
\$295	AAA 600W Sub-woofer speaker
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\$290	Creative FourPoint Surround FPS1000
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\$297	Altec Lansing ACS48 - 3p speaker
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SOUND CARD

\$24	ESS pci sound card,
\$42	Creative Vibra 128 PCI card
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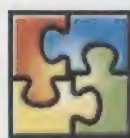
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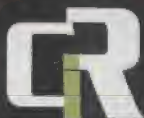
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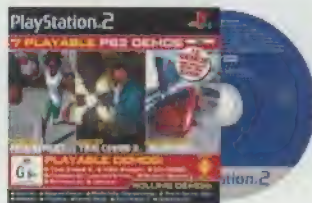
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DESCRIPTION (Kits Compatible with Printers listed below)

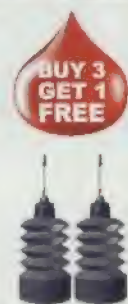
No. of Refills

Product Code

CANON BJC-300/400/500/600/800/900/1000
CANON BJC-60/55/70/80/85/85W
CANON BJC-61/62/63-10E/20/200/8JC-210/240/255/265/1000
CANON BJC-600/610/620
CANON BJC-2000/4000/4100/4200/4300/4550/5000/5500 BCI-21
CANON BJC-2000/4000/4100/4200/4300/4550/5000/5500 BC-20
CANON BJC-3000/6000/6200/6500/8000 & S400/S500 Series
CANON BJC-7000/7100 Series - Including Optimiser
CANON BJC-8200 & S800 Series
HP Desk Jet 400/500 Series
HP Desk Jet 600/650/690 Series
HP Desk Jet 700/800/900/1000/1100/1200 Series
HP Desk Jet 300 Series & Olivetti JPe
EPSON Stylus 400/800/800+1000
EPSON Stylus Colour PRO/XL
EPSON Stylus 820/eco color II/III
EPSON Stylus Colour 200/300/400/500/600/800/950/1520
EPSON Stylus Colour 440/460/480/640/660/670/700/720/740/760/900/1160
EPSON Stylus Colour 880/777/780/785/870/880/875/890/1270/1280
LEXMARK 4070/1000/1020/2000/2030/2050 Series
LEXMARK 3000/5000/5700/7000 Series
LEXMARK Z11/21/22/2231/232/242/251/252 & Other Z Series

60
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20-BKL
21-BKL
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5-BKL
19-BKL
18-BKL
46-BKL
43-BKL
52-BKL
8A-BKL
8B-BKL
29-BKL
7-BKL
1-BKL
2-BKL
23-BKL
33A-BKL
33B-BKL
Please Call
35A-BKL
35B-BKL
35C-BKL



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DESCRIPTION (Kits Compatible with Printers listed below)

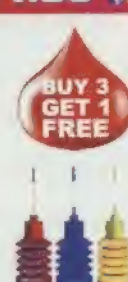
No. of Refills

Product Code

CANON BJC-300/400/500/600/800/900/1000
CANON BJC-60/55/70/80/85/85W
CANON BJC-61/62/63-10E/20/200/8JC-210/240/255/265/1000
CANON BJC-600/610/620
CANON BJC-2000/4000/4100/4200/4300/4550/5000/5500 BCI-21
CANON BJC-2000/4000/4100/4200/4300/4550/5000/5500 BC-20
CANON BJC-3000/6000/6200/6500/8000 & S400/S500 Series
CANON BJC-7000/7100 Series - Including Optimiser
CANON BJC-8200 & S800 Series
HP Desk Jet 400/500 Series & Olivetti JPe
HP Desk Jet 600/650/690 Series
HP Desk Jet 700/800/900/1000/1100/1200 Series
HP Desk Jet 300 Series & Olivetti JPe
EPSON Stylus 400/800/800+1000
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EPSON Stylus 820/eco color II/III
EPSON Stylus Colour 200/300/400/500/600/800/950/1520
EPSON Stylus Colour 440/460/480/640/660/670/700/720/740/760/900/1160
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LEXMARK 4070/1000/1020/2000/2030/2050 Series
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3x30
3x6
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22-CLR
25-CLR
10-CLR
17-CLR
47-CLR
53-CLR
14A-CLR
14B-CLR
30A-CLR
30B-CLR
16-CLR
24-CLR
34A-CLR
34B-CLR
Please Call
36B-CLR
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Seagate 18GB Barracuda - 7200rpm	\$ 456.50
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DIMM Memory PC133 - 128MB :168 pin SDRAM	\$ 47.19
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Celeron 900 / 1000
Pentium III 800 / 866
Pentium III 933 / 1000
Pentium 4 1.5/1.6/1.7G
Duron 850/900/950/1000
T-bird 1200/1300/1400
K7 XP 1500/1600/1700

Hard Drive

5400rpm ATA100
20GB Q / Maxtor
30GB WD / Seagate
40GB Quantum/Seagate
7200rpm ATA100
20GB Q/Seagate/BM
30GB Q/Seagate/BM
40GB Q/Seagate/BM
60GB Q/Seagate/BM
80GB Seagate / WD

Scsi HD

16GB Quantum 10K
18GB IBM 7200V10K
18GB Seagate 15K

Laptop HD

10/20GB for Laptop

RAM

16/32MB EDO RAM
64MB SD PC100/133
128MB SD PC100/133
256MB SD PC100/133
256MB SD PC100/133
512MB PC133/150
128/256/512MB DDR
64/128MB RAM Bus
64/128MB for Laptop
256MB for Laptop

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Case

Mid/Full Tower ATX
Apopen K7A/XP/40 45
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Lianli Aluminum Case

Motherboard

for Intel CPU

Asus CUPLE-VM
Asus CUA266 (DDR)
Asus P4T P4B
Abit S76 VP6 Raid
ECS P4VXAS 41BAS
Gigabyte 6V1XE
Gigabyte 81XC, 81DX3
MSI 845 Pro, 850 Pro

for AMD CPU

Asus A7VL-VM
Asus A7V-C, A7V133
Asus A7V266, A7M266
Abit KT7A, KT7A Raid
Abit K7, K7T Raid
Gigabyte 721H, 7V1X
ECS K7VZA, K7S5A
Epos 8K7A, 8K7A+
Intel 8K266, 8K266+
MSI Turbo, K7T Pro766

CD-Writer

Acer 40/120B, 40/16/10
Acer 40/20B
Imagema 40/16/10 IDE
LG 40/16/10 Burn Proof
Lazon 40/16/10, 40/24/10
Ricon 320B, 70B3A
Ricon 32/16/10 7163A
Ricon 40/16/10 7200A
Ricon 32/12/10/8 9120A
Sony 32/12/8 160 Scsi
Sony 40/16/10 1611I
TDK 40/24/10 IDE
Pioneer 32/12/10 IDE
Pioneer 32/12/10 Scsi
Pioneer 40/16/10 IDE
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Yamaha 40/16/10 IDE
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64MB GeforceII MX200/400
32MB Prophet 3D 4000
32MB Prophet MX 400
64MB Prophet 3D 4500
64MB Hercules GeforceII
32MB Matrox G550 DH
32MB Asus 7100 MX TV
32MB Asus 7100 Pro MX400
32MB Asus 7700 Deluxe
64MB Asus 7100 Pro MX400
64MB Asus 7700 Deluxe
64MB Asus 8200 GeforceII
32MB Winfast Gef II MX200
32MB Winfast Gef II MX Dual
64MB Winfast GeforceII 400
32MB Winfast Gef II Pro
64MB Winfast Gef II Pro
64MB Winfast GeforceII

Video Editing

Gigabyte Firewire Card
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Pinnacle DV10+, DV30+

Sound Card

Creative Live 128
Creative Live Value, Live 5.1
Creative Live Platinum 5.1
Audigy Entertainment
Audigy Platinum Int. / Ext.
Hercules Game Theater XP
Terratec 5121 Digital

Speaker

Benliron Audio Subwoofer
Creative PC Works
Creative FPS 1000, 1500
Creative DTI 2200 5.1
Abec Lansing ACS22, 33
Abec Lansing ACS 45.1
Abec Lansing ACS54, 56
Abec Lansing ATP3, ATP5
Yamaha MS201, MS350

56K V.90 Modem

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WebExcel Ext. / Int.
Swanmart Turbo Ext.
Acer, Creative External
U.S. Robotics External
Kingmax PCMCIA

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Netgear 10/100
3Com, Intel 10/100
47port USB Hub
Sport 10base Hub
Sport 10base Hub
Sport 10/100 Hub
Sport 10/100 Hub Switch
Kingmax PCMCIA 10
Kingmax PCMCIA 10/100

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Logitech Quickcam
Acer 3-in-1 Digital
Creative Webcam go Plus
Intel Easy PC, Deluxe
Kodak DVC-325
Kodak 3200/3500/3600
Kodak 3900/9000

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Orti Kismet Drive
Orb External IDE / Scsi

Scsi Card

Intel 2935 LV1
Intel 2935 Ultra wide
Adaptec 29160/39160 K8

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32 x Teac Scsi CD-ROM
10 x Samsung DVD-ROM
12 x Toshiba DVD-ROM
16 x Pioneer TraxSlad
16 x Sony DVD-ROM
16 x LG DVD-ROM
DVD Decoder Card

Monitor

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17" Auna 17d
17" LG 773N
17" LG 775, 795 Flaron
17" Hitachi CM615
17" Hitachi CM621 Flat
17" Mitsubishi 1770G
17" Mitsubishi 1786D
17" Samsung 753DF
17" Sony E220
17" Viewsonic E70E/70F
17" Viewsonic PS775
Acer / HP 25
19" Auna 19d, 19d
19" Hitachi CM721, 772
19" Mitsubishi 1995SL
19" Sony G420
21" Sony G520

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Canon BJC 54500 A3
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Epson Stylus C700X
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Epson Stylus 1290
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HP Laser 1200
HP Officejet T45, T65
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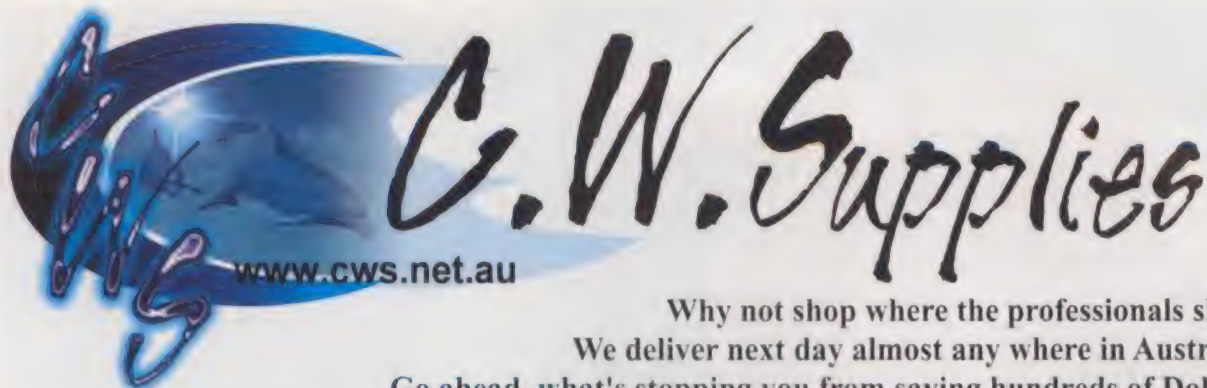
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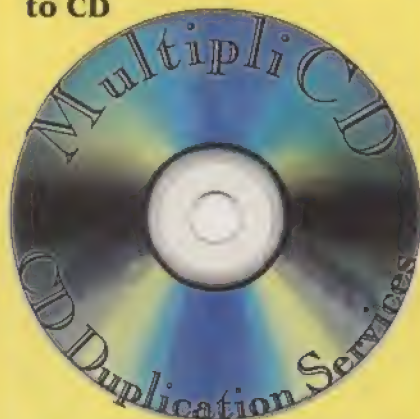
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Sharing the Net

You've got one Internet account and a few networked PCs. So how do you get them all online using a single Internet account? APC tests the latest gateway routers on the market and has a look at what's required to get routed.

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SMS superguide

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XP home networks

Windows has never been so easy to home network. A step-by-step guide to wringing the most out of XP at home.

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